GAS

APRIL 1958

Construction budgets top $2 billion

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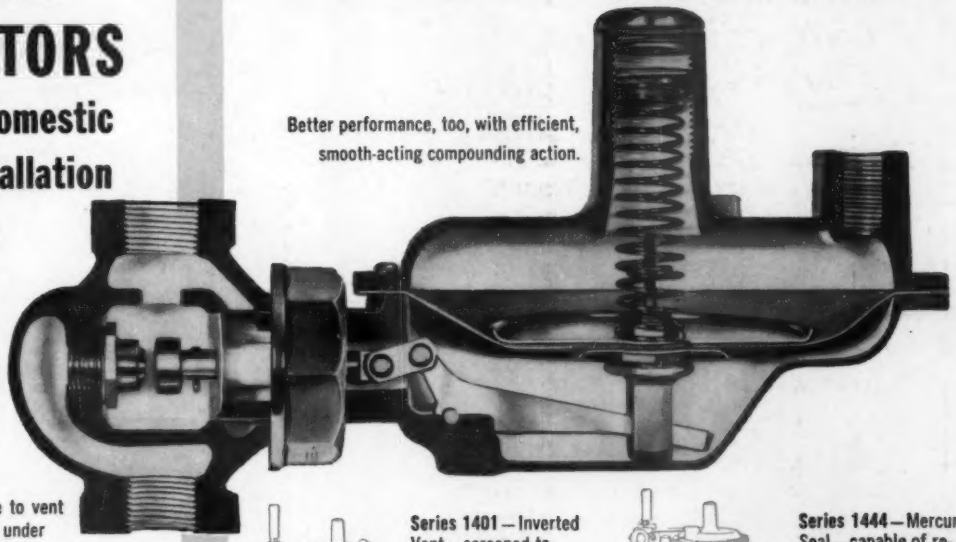

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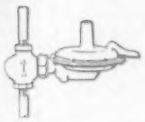

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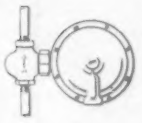

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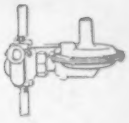

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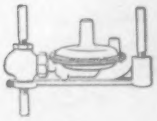

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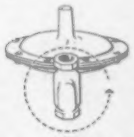

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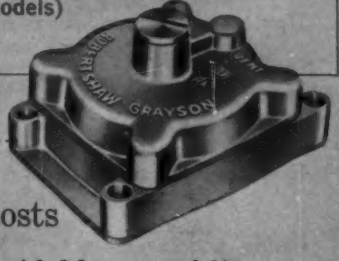

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GAS

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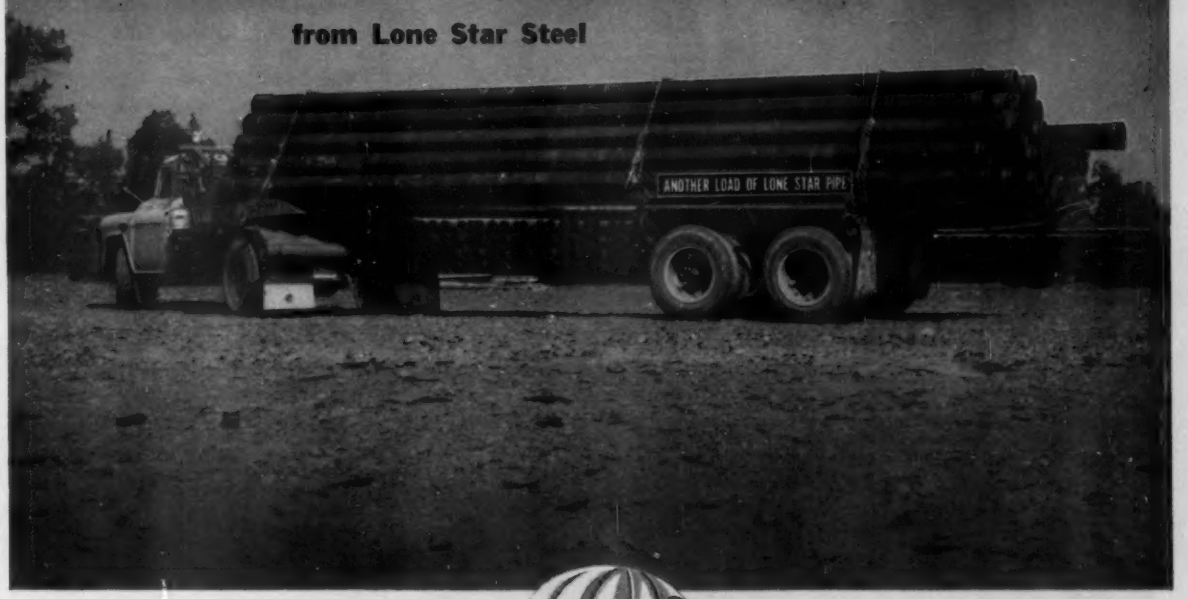

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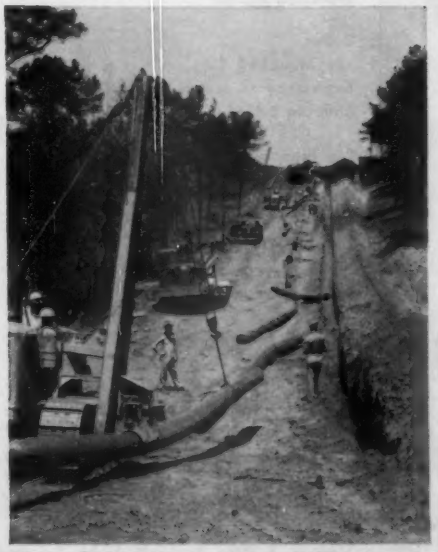

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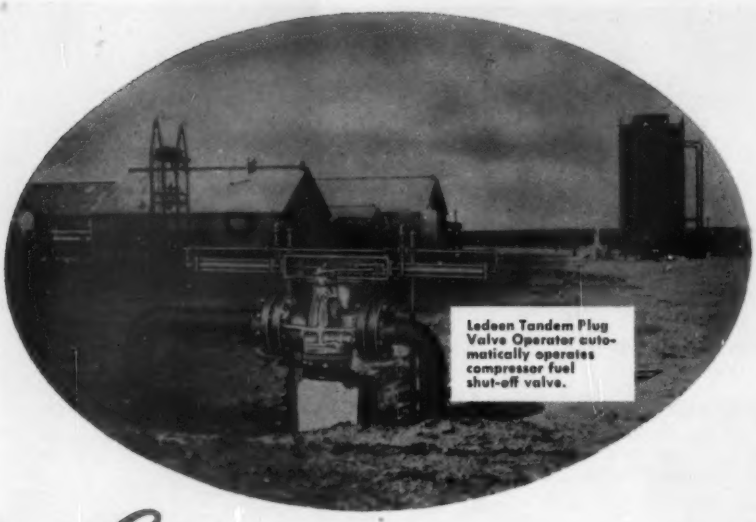

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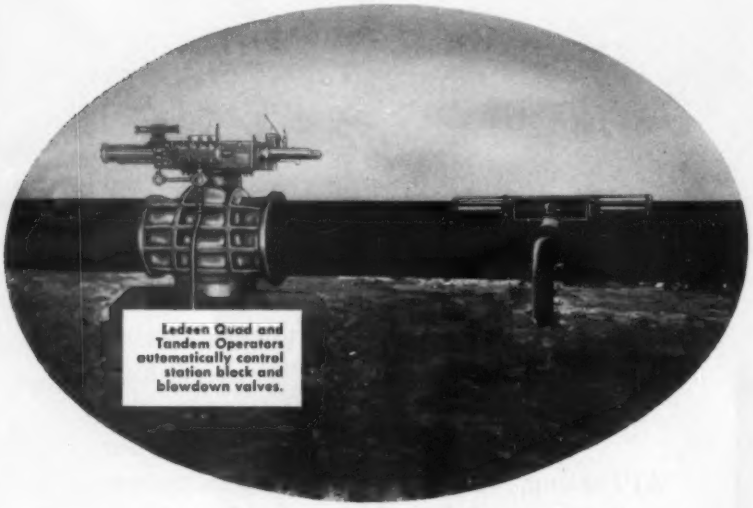

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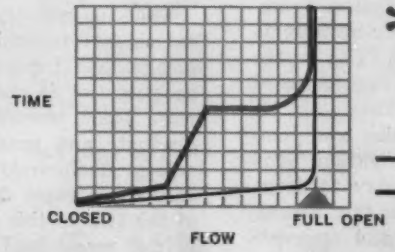

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GAS

APRIL 1958

Thermally Thinking

FOR some weeks, little green envelopes have been dominant in the mails that flood the smartly appointed editorial department of GAS. Each contained a completed form giving dope and data from individual gas companies taking part in GAS' 11th Annual Construction Survey. This survey of construction budgets feels—early in the year—the pulse of the industry and measures its "health."

Having a pimple and red rash type of allergy to desk calculators and their spawn, vast piles of statistics, I not at all reluctantly turned the compilation over to Managing Editor Don Wright. He retreated to his kidney-shaped, teakwood desk, slammed his door, and started grinding it out on our several wizard-proofed calculating mechanisms. None of these offer even the slightest competition to the DATATRON 205.

In full truth, Don attacked these data as if they were for the latest volume in the Kinsey report. Digit-splattered tape trickled from the picture window of the Mng. Ed.'s office and started working its way out Wilshire Boulevard. I could think only of the Harris-O'Hara fumbles, the "Memphis Decision," the recession and other matters that might cause our industry's gas companies to lose faith in it and themselves.

However, my concern was unfounded. Don emerged from his den with a smile on his face.

The final results of our survey show that gas companies plan to reinforce and expand their systems to the tune of over $2 billion during 1958. This is the second year in a row that total budgets have exceeded $2 billion.

It points up the sincerity with which gas companies approach their public service obligation. And it pictures the dedication by the industry to forge ahead in spite of very cancerous maladies that assault it from regulatory control, the courts and economic life.

This is what the gas companies had to face when making their decisions to continue building in 1958: First, a slump in drilling, particularly wildcat wells, during 1957. This decrease in drilling and exploratory drilling for new natural gas reserves means less gas during some years ahead. It didn't make sense in view of the lasting demand for natural gas. It didn't make sense, that is, until you considered the poor prospects for passage of the Harris-O'Hara or other bills to free independent producers of federal controls.

Second, the gas companies had to decide what the Memphis decision meant. Some new construction projects were sidetracked or postponed. But most companies seem to be holding firm on expansion even in the face of this sickening court decision. They are putting a lot of trust in the U. S. Supreme Court overturning the lower court's ruling. Actually only two or three companies hedged their construction budget reports with references to the Memphis decision.

Recession psychology was another factor to be hurdled. One can't help admiring the hundreds of gas companies that are not letting this economic adjustment scare them out of needed system improvement and construction.

The facts are that there are unsaturated markets for natural gas, there is growing recognition of the desirability of this efficient and convenient fuel, and the bloom is not off of the gas industry that will not lose sight of the future even when the going turns from rough to rougher.

* * *

The gas industry has an excellent educational research facility available—the Institute of Gas Technology. Yet I doubt that it is fully extended as far as potential is concerned. Never have we needed more basic research and more people with undergraduate and graduate enlightenment in gas technology. I sincerely urge every reader to digest Rex Ellington's paper describing the educational program of the IGT in this issue. Use the IGT and its reservoir of research. Let's extend Dr. Elliott and staff a little. The results will be the industry's gain.

J. Fred Ebsen
EDITOR

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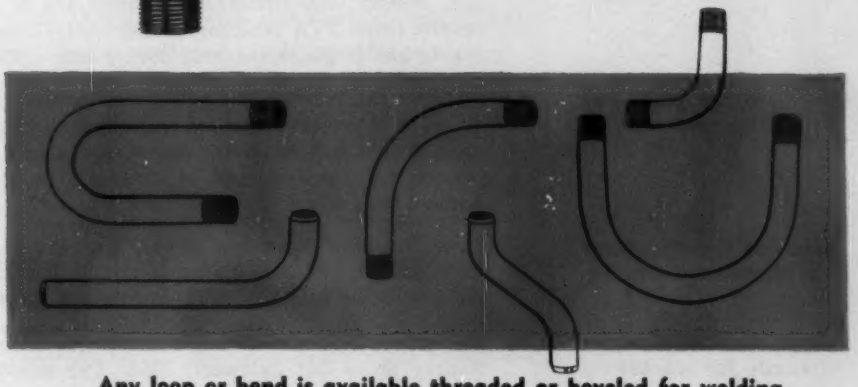

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GAS HIGHLIGHTS

Gas construction budgets top $2 billion

The gas industry's 1958 construction and expansion spending will top $2 billion for the second straight year. GAS' 11th annual construction budget survey shows that 216 companies will spend $2,045,449,000 this year. For the details, see the complete report starting on page 57.

Midwestern, Peoples agree on pipeline

Part of Midwestern Gas Transmission's projected Portland, Tenn., to Emerson, Man., line may get started this year. Peoples Gas Light & Coke Co. (Chicago) has withdrawn its opposition to the southern section of the line, and has agreed to buy from MGT. Northern Natural (Omaha) and American Natural (Detroit) still vigorously oppose the northern section. MGT-Peoples accord was reached in series of meetings arranged by Illinois Gov. Stratton. FPC now may allow early construction of the line to a point in central Wisconsin.

Transwestern plans early FPC filing

Transwestern Pipeline Co. (Houston) is shooting for an April FPC filing in its bid to build a line from West Texas to California. Plans for the pipeline are now on the drawing boards.

Heat pumps go sour in long cold spell

Heat pumps went sour in Chattanooga, Tenn., during long February cold spell. Nineteen electric compressors had to be replaced in a 22-house all-electric development. Three that did operate couldn't keep homes warm. Result: Chattanooga Gas Co. is now installing 17 new Ark-La Servel all-year gas units. Of the remaining five, two owners haven't yet been contacted. Three who chose to keep GE Weathetron units are employees of TVA. Several of the heat pumps in the Lake Hills development had operated successfully during mild '57 winter. This year, when temperatures dipped to zero three times in February, they couldn't do the job. Nearly 1000 electric heat pumps are in use in Chattanooga. Now, despite cheap TVA tax-financed electricity, owners are considering switching to gas to guarantee heat during long cold spells.

Norge plans gas refrigerator for '59

Another gas refrigerator will be on the market next year. Norge Corp. says it will market a gas box powered by a Swedish Electrolux absorption unit. Norge will use same cabinet now housing electric model. Company also says it has developed an automatic ice maker, which will be incorporated on gas model. Field tests will start this summer.

Supreme Court refuses early Memphis ruling

U. S. Supreme Court has refused to make an early ruling on Memphis decision. Despite requests by Solicitor General and FPC, appeal will not be considered until the high court's fall session.

Remote control range ready for marketing

A remotely controlled, push button gas range has been developed by Sunray Stove Co., Delaware, Ohio. The remote control panel allows the homemaker to turn the range or oven on—to a designated temperature—or off from almost anywhere in the house or yard.

Justice Department to proceed with EPNG case

Supreme Court has cleared the way for the Justice Department to begin its anti-merger action against El Paso Natural Gas Co. The high court refused to review a lower court ruling in the El Paso-Pacific Northwest case, which held that the suit did not intrude upon FPC's regulatory authority.

Panhandle Eastern seeks rate increases

Panhandle Eastern Pipe Line Co. (Kansas City, Mo.) has filed the first rate increase with FPC since the Memphis decision. Panhandle is seeking a $12 million annual rate boost.

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Regulatory and Legislative Trends

A COMMENTARY ON NATIONAL AND STATE DEVELOPMENTS BY AN EXPERT IN UTILITY LAW

Fair value wins again

THE relentless increase in the cost of labor and materials since World War II has made original cost rate bases deficient in reflecting present fair value of utility property. The Iowa supreme court recently protected a utility in a gas rate case from being denied a fair value rate base. That court decision is significant, and contains hope for the utility owners, so let us review it.

• Rate-making methods

The court considered whether evidence of present fair value of property devoted to utility service was essential to test the rates for confiscation.

The court recited that the utility claimed that evidence of the cost to reproduce the property should receive the greatest weight in determining fair value. The rate-making body relied on the "end result" theory announced by the United States Supreme Court in the history making Hope Natural Gas case. The agency prescribing the rates relied on evidence of the original cost of utility property and rejected reproduction cost as evidence of fair value.

The supreme court of Iowa stated that its understanding of the Hope case is that no specific method is required in prescribing utility rates. The court asserted:

"The sum total of this Hope decision is thus seen to have been often misunderstood, distorted and exaggerated by those who used it as an authority for the proposition that formerly established normal conventions of rate-making are now obsolete and that a rate base need not be determined in a public utility rate-making procedure. Indeed, this court does not perceive how any calculations of depreciation, legitimate financial expenses or indeed other calculations indispensable to regulating the rates of a public utility company without violating its rights under the due process clause can proceed without giving consideration to the somewhat baffling, but nevertheless unavoidable problems attendant upon ascertaining a rate base reflecting, to avoid confiscation, the fair present value of the property.

"This is certainly indispensable to the obligations of the court recognized in the Hope decision, to give the equity owner a return 'commensurate with returns on investments in other enterprises having corresponding risks,' and to insure a return which will 'be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.'"

* * *

"We conclude the most that can be attributed to the Hope case is that the United States Constitution does not require any specific method of determining a fair rate base and that any reasonable method may be used, including original cost and reconstruction costs, if the end result does not disclose an unfair or confiscatory rate."

The law cannot be said to be static. It grows with changing conditions but always under the impulse of reason. The Constitutional guarantees against the taking of private property without due process of law should be kept according to the Iowa supreme court.

In a government like ours popular approval is often given to plausible theories of public good, but courts are not permitted to forget that the law is the only chart to use in guiding the ship of state.

• Fair value

Speaking of fair value the court stated:

"The arguments against fair value are all ones of expediency, not ones of justice or fundamental fair treatment. It is obvious that fair value introduces certain problems of proof. There must be estimates of reproduction cost, and of course these are by necessity estimates, but they are estimates of the cost of a plant in existence. They are close enough for practical purposes, and are obviously more likely to be reasonably correct than contractors' estimates of a plant to be built, on which estimates billions of dollars have been and will be spent.

"Furthermore, with the complete bookkeeping records now kept, it is not too difficult or expensive to apply trended percentages to original cost and thereby obtain a trended original cost, which will serve as a very accurate guide to the general effects of inflation, over the life of the property—or, as the case may be in some instances, deflation. Since neither original cost nor trended original cost nor reproduction costs are final ends in themselves, but only guides to judgment in arriving at 'fair value,' precise mathematical figures are not mandatory. The original cost of a piece of real estate or property 60 years old is obviously not a sound basis for judgment of value today, and is obviously far more out of line than any estimate of reproduction cost or of trended original cost. These criteria are also far more definite and clarifying than the vague and indefinite 'end result.'"

Many states by statute still require consideration of the fair value of utility property by rate-fixing bodies. Iowa is content to remain one of that group who consider a fair value rate base necessary in order to determine a reasonable return to the owners of utility property.

The court declared there are several factors tending to establish present fair value. The factors described were original cost, current reproduction cost, and trended original cost. One question is how much weight is to be given to each factor to arrive at the present fair value of the property. The court said:

"We think that where construction costs have been substantially level for a long period of time, perhaps for a large part of the average life expectancy of a utility property, original cost would merit major consideration. Where fluctuations of price levels are sharp, but seem likely to balance out over a short term, a '50-50' weighting such as that given by the trial court would be completely tenable. However, where construction costs have fallen more or less continuously over a substantial period of time, or have risen more or less continuously over such a period, original cost can be given weight only to the extent that a return to the same level appears reasonably imminent.

"It would appear that the level of construction costs which can be expected to prevail in the foreseeable future would be a floor below which the pricing of the present value of a utility property could not go without entering the area of possible confiscation. In this, as in any other constitutional inquiry, the duty of the trial court is to determine the facts from the material and competent evidence before it, and not on its own impulse. We believe that in its approximate '50-50' fair value determination, unsupported in the record, the trial court was in error." * * *

"We are persuaded, by a careful review of the testimony in the record, that the trial court was not realistic in giving approximately a '50-50' weighting to the valuation evidence submitted by the parties on original cost and on reproduction costs. We conclude greater weight on reconstruction value must be given to the extent hereafter indicated."

The court criticized the original cost of construction less depreciation as a measure of value because it does not lend itself to a reflection of economic changes. The court said the cost of reconstructing the utility property at current prices is a helpful guide. The supreme court of Iowa arrived at the fair value by considering both original cost and reproduction cost less accrued depreciation.

The court continued its analysis:

"The most serious problem in allocating weight to the estimates of the experts, both as to original cost depreciated and reproduction costs depreciated, is due to the period of rising prices experienced throughout the nation since 1939. In a period of fairly constant dollar values (almost unknown to this generation) there is no serious objection to a valuation based on costs, for then replacement costs to a great extent would be the same as original costs. No one knows when we shall again obtain that period. Thus, as pointed out in Thompson & Smith, Public Utility Economics (1941) 289, the principal objection we have to such valuation is that it tends to make utility rates too rigid.

"Presently, the owners of the equity are hurt by original cost, but it can be the ratepayer who feels the pinch in times of declining prices, prices below costs. Present value in that situation would be less than the historical cost.

"Consideration of the present price level brings the point home. * * * In other words, the dollar has lost one half its purchasing power in commodities during that period of time, thus doubling the cost of items needed as replacement for an operating business. It is truly as though we were now using a different currency. Practically all segments of the country's economy are using a reduced unit of exchange. Should utility companies be treated differently? We think not."

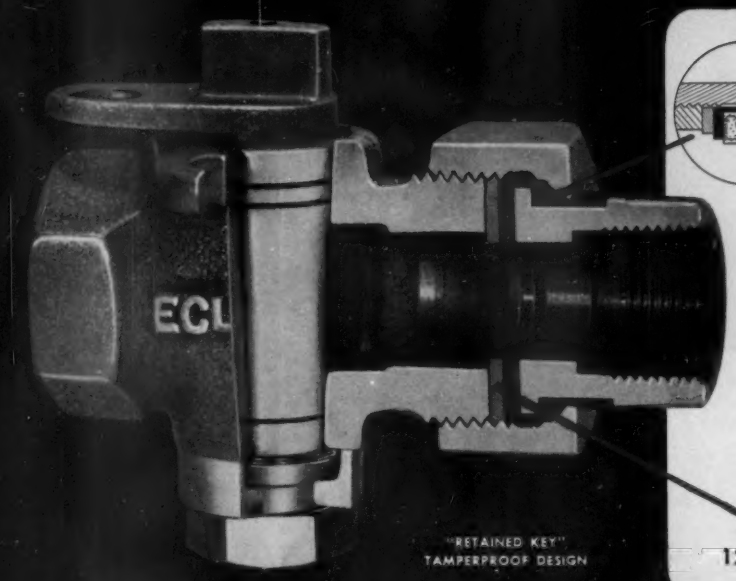
• The refreshing power of justice

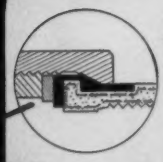
The Iowa supreme court relied upon a decision by the eminent Federal Judge Learned Hand to describe the basis upon which a utility may seek a new value determination and rate relief. Judge Hand announced that:

"It is true that individual misfortunes cannot be foretold, and these a given company must bear, just as any single competitive venture would have to bear them. Among these, however, is not a general rise in prices, which, affecting all alike, at least after a time, enables each to raise his price, not only because of his costs in labor and materials, but to obtain a proportionate increase in his profit, based upon the increased value of his plant and machinery. * * * The risk of the depreciated dollar is not one which industry in general will bear. * * * It must, of course, appear that the variation in prices is not transitory, and the period of probation before a company is allowed relief is precisely to insure against that possibility. The chance of loss during that period such companies must endure, and there is an inevitable 'lag' in readjustments in either direction. But once it appears that the new price levels are not transitory, it is no answer to the company's complaint to say that at some future time prices may fall. When that time comes, if it does, the property must again be revaluated; but meanwhile they are entitled to some protection, and since these have become questions for the courts, to the protection of the courts."

The supreme court of Iowa said that no one can seriously dispute the facts known to everybody that the depreciated dollar has no immediate probability of returning to its old value. With the government's high debt and other climbing costs new values seem to be here to stay. These considerations led the court to conclude that great weight should be given to the current cost of reproducing the utility property in determining the present fair value rate base for the company. ■

New Wedgeseal -insulated gas cocks combine shutoff and insulation



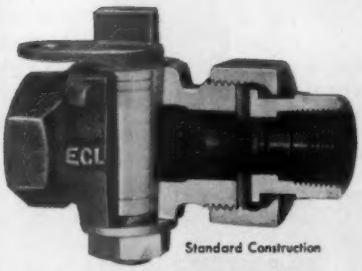


ECLIPSE
Wedgeseal
INSULATOR
... insures positive insulation

CAN'T GET LOST OR LEFT OUT

WON'T SHEAR OFF, PULL OUT, OR CRACK IN SERVICE

NEOPRENE GASKET
125-lb test. Patent applied for



Standard Construction

Eclipse Wedgeseal-Insulated Gas Cocks currently are stocked in ¾" lock wing patterns. Very shortly they will be available in sizes ¾" through 1¼", both lock wing and flat head styles, standard and "Retained Key" constructions.

Simplifies Installation, Prevents Error, Saves Time and Money

Service-proved Eclipse iron-body, brass-core gas cocks now are offered in combination with the most effective, strongest insulating union on the market — the integral Wedgeseal. Here is dependable shutoff combined with superior means for insulating mains and services from stray or induced house currents. Wedgeseal gas cocks reduce initial cost, number of threaded connections, and make-up time.

The Wedgeseal (Zytel 105) insulator is integral with the tailpiece — no separate collar to be lost or left out; an insulator that is used in compression only, that will not shear off, pull out, or crack in service. It has more than adequate strength to take all strains imposed by house and service piping — will successfully withstand 350-lb torque test. Wedgeseal extends over the flange and washer face of the tailpiece — no possibility of re-establishing metal-to-metal contact, of jumping or shorting. Wedgeseal has exceptionally good dielectric strength and is not affected by manufactured, natural, or LP gas. It is weather-resistant, stable at temperatures up to 400° F, and suitable for continuous operation at temperatures up to 275° F.

Try a Wedgeseal-insulated gas cock free. Use the convenient coupon.

FREE WEDGESEAL TEST UNIT — Send for free Wedgeseal-insulated ¾" gas cock — see for yourself its advantages.

GAS SERVICE PRODUCTS DIVISION,
ECLIPSE FUEL ENGINEERING CO.
1109 Buchanan Street, Rockford, Illinois
Eclipse Fuel Engineering Co. of Canada, Ltd.
120 Upjohn Road, Don Mills, Ontario
Export Agents: Ad. Auriema, Inc., 89 Broad Street, New York 4, N.Y.

Please send ☐ Retained Key ☐ Standard

NAME.....

COMPANY.....

STREET ADDRESS.....

CITY.....STATE.....

PRESSURE TESTED NON-LUBRICATED GAS SERVICE VALVES

- Each individual valve must pass *tight closing* test at 25 lbs. of air pressure under water
- Each individual valve body must pass *no-leakage* test at 100 lbs. of air pressure under water
- "Mirror" seal eliminates need for lubricant

Held tightly by the patented closing wedge, the mirror-finished gate and seat surfaces of the List G-90 valve are precision ground to provide the perfect, cohesive seal. *Absolutely no lubricant is necessary . . . ever!*

Write today for full information on List G-90 valves—specified by leading gas companies for over 50 years.

LIST **G-90**

For dependable control of natural or artificial gas lines

Above: 2-inch valve showing Dresser coupling assembly and internal wedge and gate mechanism.

LUDLOW & RENSSELAER

VALVES AND HYDRANTS

THE LUDLOW VALVE MANUFACTURING CO., INC., TROY, N. Y. SINCE 1861

TECHNICAL TRENDS

By GUY CORFIELD

Measuring temperatures by photography

On the October, 1957, issue of this page, under the title "The Realm of Infrared," it was mentioned that photographs could be taken at night with "invisible (infrared) light." This is because different objects are always at different temperatures to each other and to their surroundings and therefore will show in contrasting shades of white, gray and black on infrared sensitive film. Actually, objects in the infrared heat range (below 1000°F) can be similarly photographed in the day time in terms of their infrared ray emission because visible light is not involved. Moreover, as an extension of this concept, accurate temperatures of objects can be photographically recorded, i.e., a thermal picture can be obtained. It is not necessary to be able to touch or to even be close to the objects and, to a degree, they can even be thermally photographed while in motion. This technique, recently de-classified, has been developed by the Barnes Engineering Co., 30 Commerce Road, Stamford, Conn., and the instrument is called the Barnes Infrared Camera.

The following description of its operation is quoted from *Chemical Engineering*, December, 1957:

"In essence, the Barnes Camera scans (like a television camera) an object in horizontal increments to pick up varying amounts of infrared energy radiating from it. An infrared detector in the camera (a thermistor bolometer or radiometer) produces an electrical signal proportional to the amount of infrared energy received. After amplification, this signal modulates the output from a visual-light glow tube. A recorder mirror mounted integrally with the scanning arrangement casts this varying light beam on the photosensitive film, duplicating the scanning pattern on the object being photographed.

"The detector or radiometer electronic system can be adjusted to cover a narrow or wide temperature range. Also an electronic temperature offset permits the operator to shift the range up and down the temperature scale.

"Sensitivity is high and depends on the time taken to scan the object. The camera detects differences as small as 0.04°F with a 15-minute scan, up to 0.4°F with a 2-minute scan.

"Total infrared emitted from various parts of the target area can be determined quantitatively by measuring the density of various parts of the print. However, by a system built into the camera a series of eight density steps ranging from black to white are produced along the edge of each picture. This gray scale calibrates the print in terms of the radiometer signal. Thus thermal analysis of the print is independent of the glow tube and the film-developing process.

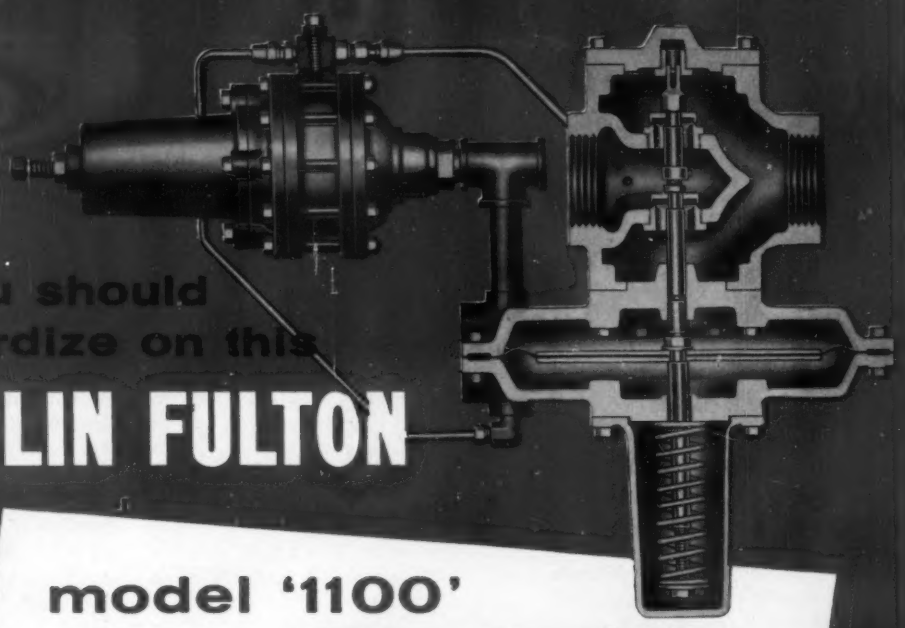
"Each step in the gray scale represents a precisely known radiation temperature level. By visually comparing various sections of the print with the gray scale, the picture can be analyzed quite accurately. Since the radiometer system can be adjusted to make small temperature differences produce different tones of gray in the picture, temperature can be measured accurately without resorting to densitometer readings."

The cost of this Barnes Camera is about $20,000. However it would seem that for research and development work, and plant control, it would frequently be well worth the investment and sometimes indispensable. The object can be thermally scanned to any accuracy desired, no point is missed, and a permanent record is obtained. In research it would probably be possible to detect evidence of vibrational stresses, and differences in rate of chemical activity, evaporation or absorption, etc., by local temperature differences in experimental assemblies. In development, for instance, the thermal pattern of a furnace or refrigerator jacket, or appliance heat exchanger, could be readily observed. In operating control, any portion of a plant or piping system or other assembly could be photographed to determine heat distribution, points of overheating, poor insulation, and heat loss.

Patent Office modernizes its searching system

Many inventors are irked by the length of time required for a patent search. Years may elapse before it can be decided whether their idea is new, or already reposes in the U. S. Patent Office files. An improvement is indicated, however, with the announcement that steps toward mechanized searching of records have been taken.

Already in use is a Bureau of the Census multi-column sorter, which automatically selects punched cards carrying the desired information. It can search 2000 patents in 5 minutes, as compared to about 6 hours by manual means. Delivery has more recently been taken on a ILAS (Inter-Related Logic Accumulating Scanner), a super card sorter. ILAS not only sorts punched cards, but it performs 12 different operations or selections on each card. It is believed that it can, when a suitable code is prepared, search all the prior art on record in the Chemicals Division of the Patent Office. It costs about $13,000 and subsequent models will be cheaper. This cost seems negligible, considering the time and manpower that can assertedly be saved. ■



you should standardize on this

CHAPLIN FULTON

model '1100' gas regulator

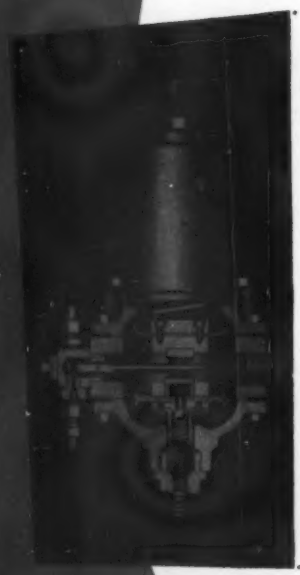
Let's not beat around the well head, this Model "1100" is the most versatile gas regulator in the business. It gives a wider range of flow control in industrial, commercial or distribution installations. Just look at these points of superiority:

wider application
Inlet Max.—400 psi. Outlet Range 1" to 150 psi. Size—2" only, screwed, flanged 125 or 250 ASA

greater capacity
24,000 cfh at 10 psi to ounces; 114,000 at 100 psi. Body contoured for flow

easier maintenance
Regulator or pilot can each be serviced without disturbing the other. Easily accessible orifices in both, quickly renewable

simpler installation
Only one connection required. No complicated pins or toggles to adjust



the heart of model 1100

TYPE 51 VARIABLE PRESSURE PILOT

- Unitized construction—valve lever and orifice as a unit are removed from the outside, without disturbing balance of assembly. The likely trouble spot, the orifice, is outside where you can get at it quickly. No internal tubes to clog.
- Twin diaphragms remove as a unit
- Internal relief unit—guards against overpressure
- Spring unit—remove three screws to change springs
- Built for service
- Used for accuracy

Write for bulletin 1100

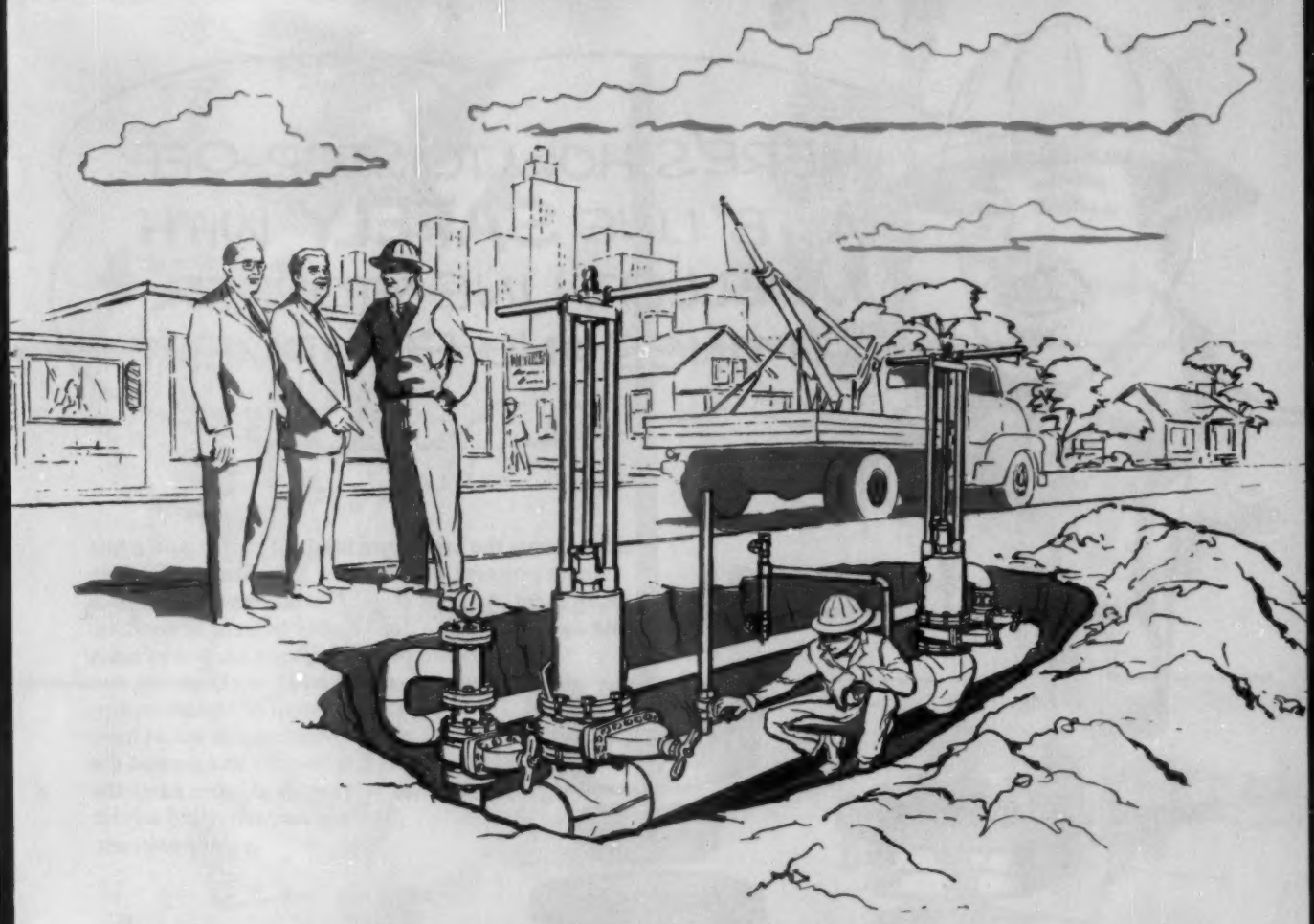
ACCURATE CP MFG CO DEPENDABLE

WBW-6834

Chaplin-Fulton

MANUFACTURING COMPANY

Pittsburgh 25, Pennsylvania



MUELLER® *line stopper fittings and equipment*

Stop-off lines Safely under pressure!

Eliminate many hazards and service interruptions on your gas distribution system. Mueller Line Stopper Fittings and Equipment permit you to safely stop-off your lines at any point — regardless of the location of regular shut-off valves. Line stoppers may be used *anywhere* on any type of line from ¾" through 12".

Yet, customer service need not be interrupted. Gas flow may be conveniently by-passed around the section of line to be worked on. A steady flow of gas downstream supplies customer's demands and keeps pilot lights burning during repairs or modifications. By purging air from the section after work is completed, even "slugs" of air in the line are eliminated.

All operations are performed under pressure without blowing of gas. There is no danger of ignition caused by static electricity that is often generated when gas is allowed to blow.

The use of Mueller Line Stopper Fittings and Equipment adds flexibility to your distribution system and reduces valve maintenance costs, too. Once installed, the fittings may be used to stop-off the line whenever necessary. And these installed fittings require no maintenance of any kind.

Turn the page for the illustrated story of a typical stop-off being made on an 8" line.

NO-BLO®

MUELLER CO. Since 1857 SERVING Water and Gas Industries QUALITY

MUELLER CO.
DECATUR, ILL.

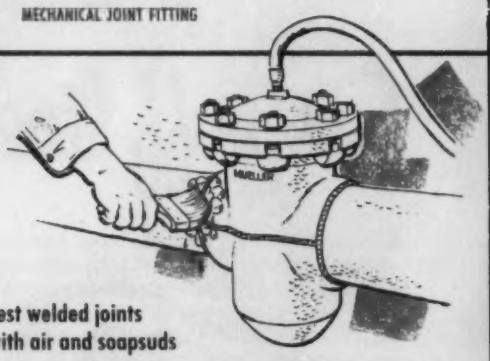
Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

HERE'S HOW TO STOP-OFF AN 8" LINE **SAFELY** WITH MUELLER LINE STOPPER FITTINGS AND EQUIPMENT

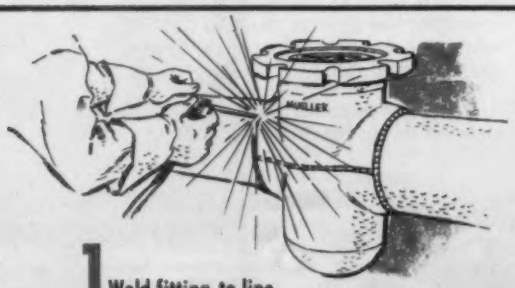
Here is shown the procedure used in stopping-off a line under pressure with Mueller Line Stopper Fittings and Equipment. A single stop-off is illustrated — such as might be used to extend a dead end or to transfer services. To completely isolate a section of main to repair leaks, make tie-ins, run laterals or install or replace equipment, two stop-offs would have to be made. A by-pass line around the isolated section would then carry the flow for uninterrupted service downstream.

WELDING FITTING

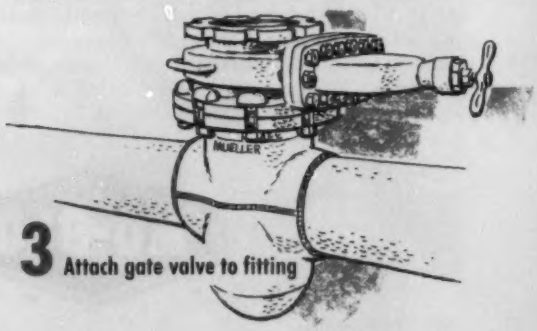
MECHANICAL JOINT FITTING



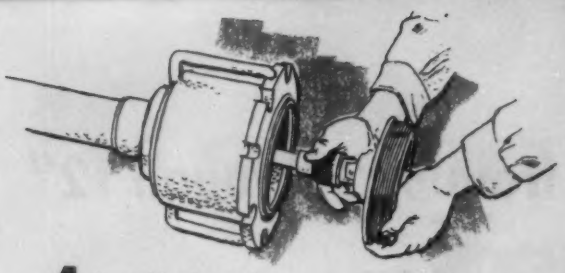
2 Test welded joints with air and soapsuds



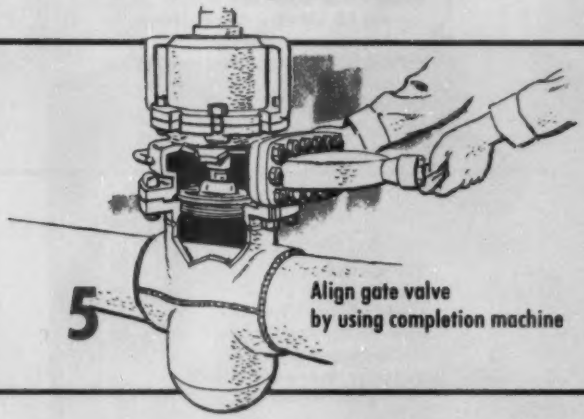
1 Weld fitting to line



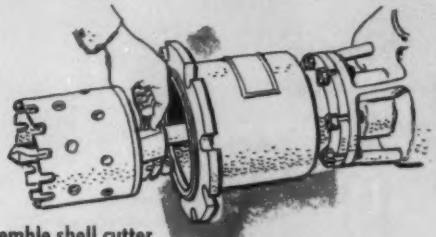
3 Attach gate valve to fitting



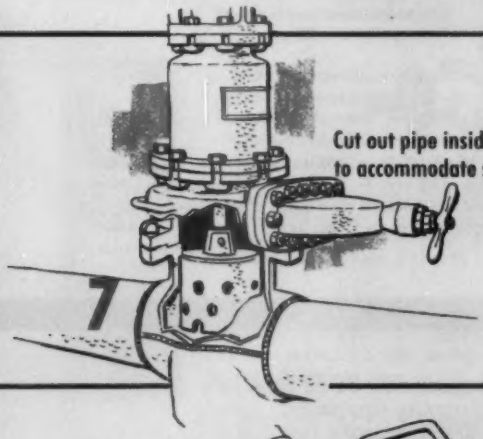
4 Assemble plug and aligning tool to completion machine



5 Align gate valve by using completion machine



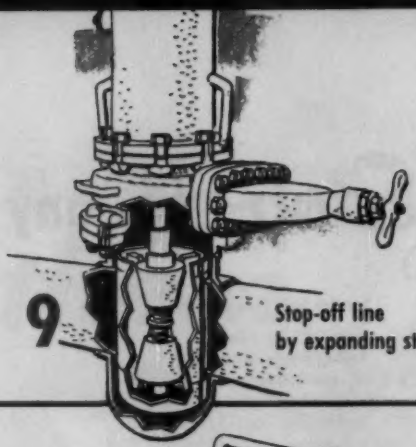
6 Assemble shell cutter, hub and pilot drill to drilling machine



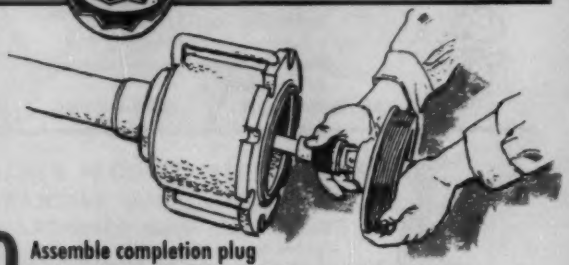
Cut out pipe inside of fitting to accommodate stopper

7

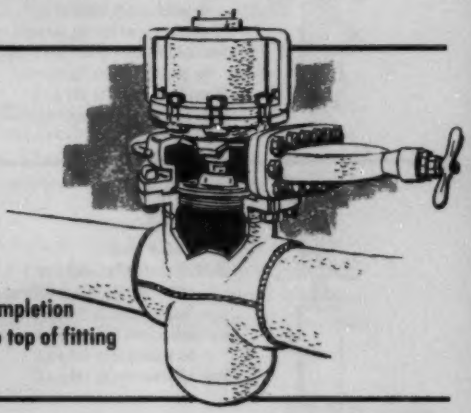
8 Assemble steel wedge stopper to stopping machine



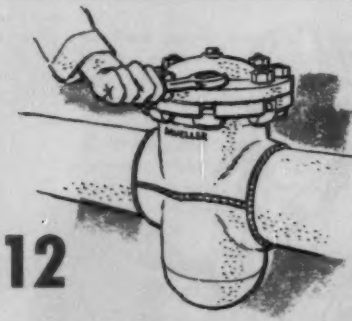
9 Stop-off line by expanding stopper



10 Assemble completion plug and inserting tool to completion machine



11 Insert completion plug into top of fitting



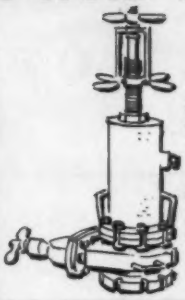
12 Bolt completion cap in place on fitting

These illustrations quickly outline the major steps in the use of Mueller Line Stopper Fittings and Equipment. Operating instruction manuals, which give complete information, are furnished with each line stopper unit.

Stop-off any line from ¾" through 12"

Service Line Stoppers

for ¾", 1", 1¼" lines
Welding fittings for steel pipe
Cast iron threaded caps —
for pressures to 250 p.s.i.
Steel threaded caps —
for pressures to 1200 p.s.i.
(Mueller E-4, EH-1 or T machines are used for all operations.)

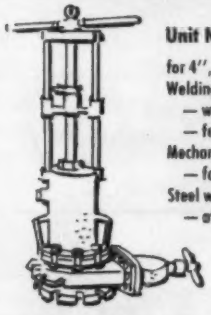


Unit No. 3

for 6" and 8" lines
Welding fittings for steel pipe
— with 150, 300, 400 or 600 pound flanges
— for pressures to 1200 p.s.i.
Mechanical joint fittings for steel or cast iron pipe
— for pressures to 175 p.s.i.
Stop-off pressures to 60 p.s.i.

Unit No. 1

for 1½" and 2" lines
Welding fittings for steel pipe
Cast iron threaded caps —
for pressures to 250 p.s.i.
Steel threaded caps —
for pressures to 1200 p.s.i.
Mechanical joint fittings for steel or cast iron pipe
Solder-braze fitting for Type K copper pipe —
for pressures to 125 p.s.i.
Stop-off pressures to 125 p.s.i.
(Mueller D-4 or DH-2 machines are used to drill the pipe.)

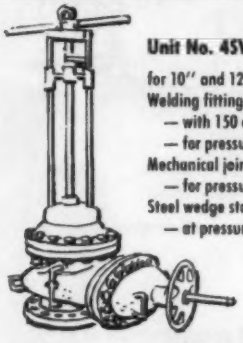


Unit No. 35W

for 4", 6" and 8" lines
Welding fittings for steel pipe
— with 150, 300, 400 or 600 pound flanges
— for pressures to 1200 p.s.i.
Mechanical joint fittings for steel or cast iron pipe
— for pressures to 175 p.s.i.
Steel wedge stopper used to stop-off
— at pressures to 230 p.s.i.

Unit No. 2

for 3" and 4" lines
Welding fittings for steel pipe
— with 150, 300, 400 or 600 pound flanges
— for pressures to 1200 p.s.i.
Mechanical joint fittings for steel or cast iron pipe
— for pressures to 175 p.s.i.
Stop-off pressures to 100 p.s.i.



Unit No. 45W

for 10" and 12" lines
Welding fittings for steel pipe
— with 150 or 400 pound flanges
— for pressures to 800 p.s.i.
Mechanical joint fittings for steel or cast iron pipe
— for pressures to 175 p.s.i.
Steel wedge stopper used to stop-off
— at pressures to 500 p.s.i.

(Mueller CC-36 or C1-36 machines are used to cut the pipe when using units No. 2, No. 3, No. 35W or No. 45W. Fittings for these units are similar to those shown on preceding pages. Completion plugs for fittings from 3" through 12" have an "O" ring seal and built-in equalizing valve.)

For the full story and specifications on Mueller's complete line of line stopping equipment, consult your Mueller Representative or write direct.

Ask for your free copy of Booklet No. 5, "NO-BLO® Methods and No-Blo Applications", too.

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SIEGLER'S TROUBLE-FREE PERFORMANCE GUARANTEES WARM FLOORS AND SATISFIED GAS CUSTOMERS

Satisfied customers are your best defense against competition. And what customer wouldn't be satisfied with the benefits that only Siegler offers:

"Traveling" Floor Heat. A Siegler puts the heat on the *floor* . . . *"travels"* the heat to *every* room.

Siegler's Patented Heat Tubes capture all the heat. The Patented Built-in Blower System "travels" it over the floor. That's why Siegler alone can offer this guarantee: *more and hotter heat over the floor—or money back.*

Here's performance and features you can show and dramatically demonstrate. That's why it's easy to sell customers up to Siegler. And profitable too . . . Siegler makes warm friends for gas and *all* gas appliances.

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4. Your profit stays in your pocket . . . no loss for call-backs and complaints. Siegler quality sees to that and makes every customer an enthusiastic salesman for you.

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6. Your Own Merchandising Man. Your Siegler Representative is a full-time, trained specialist in the home heater field. He will show your salesman how to "sell 'em up" to Siegler, and help you plan your advertising, promotions and demonstrations.

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WRITE FOR Siegler GAS HEAT PROMOTION PROGRAM

The Siegler Corporation, Dept. G-4
Centralia, Illinois

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Gas Home Heaters

Gentlemen: Please send information on Siegler's plan for building gas heating sales.

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Company Name_____

Address_____

City_____ State_____

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steel, alloy, and seamless carbon pressure pipe ... they'll deliver fast—from warehouse stocks

Yes—"Call L. B. Foster" is a phrase you hear more and more among today's pipe buyers. Our ever-growing warehouse stocks are a good bet for finding the exact pipe you need—and in all the quantities you may need, including the extra-large sizes and the hard-to-get items. Try "Faster-from-Foster" service for all your pipe requirements—seamless, seamless carbon pressure pipe, seamless alloy, prime tested and structural—⅛" thru 36"—and now aluminum and PVC pipe, valves, fittings.

Call or wire today . . . to your nearest Foster office.

One of the nation's largest pipe stocks—in six Foster warehouses—all sizes, ⅛" thru 36".

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WASHINGTON

By NEIL REGEIMBAL
GAS Washington Bureau

This is it for gas legislation

A SHOWDOWN is building up for the beleaguered gas industry. It'll come to a head within the next few months.

In each of the last two years, the distributing and pipeline segments of the industry have shared black eyes with the producers for "unfortunate incidents" which have progressively lowered the entire industry's public relations stock to a damagingly low point. If the Harris-O'Hara gas bill doesn't make it this year, there's no sense going back for some years, and if the Memphis decision isn't reversed by the Supreme Court, the industry might as well plan on living with it for some years at least, these spokesmen warn.

As the gas bill trembled down the legislative path toward a nip-and-tuck showdown vote in the House its supporters were panting from their efforts to breathe life back into the measure. They were wearily hoping their efforts had cleaned enough of the Texas mud —administered purely by ineptness —off the bill to get it through.

If not, both Rep. Oren Harris (D., Ark.), the bill's majority sponsor and primary backer, and Rep. Sam Rayburn (D., Tex.), powerful Speaker of the House, made it clear that they didn't want to hear any more about natural gas legislation for some time to come.

Even before the Texas GOP fund-raising dinner exploded into another alleged "influence" attempt, Harris and Rayburn were getting a little discouraged with the gas problem.

Both had been worn down to a nub trying to work out the compromise between the coal interests and the gas pipelines to get the so-called coal amendment — prohibiting dump sales to industry— into the measure. This amendment was a must, first to marshal enough coal votes to pass the bill, and also because the President had made it clear that he would demand such a provision before clearing the bill if it passed Congress.

The entire legislative history of the gas bill this year has been a classic exercise in practical politics, complete with direct and indirect pressure from Congress on the White House and back again, deals, compromises, and roughhouse tactics of the most skilled type.

After the unfortunate Texas dinner "revelation," both Harris and Rayburn reportedly made it clear that they would work to patch the measure up, but that it would come to a vote only if the President let it be known he would not repeat his political veto of the 1956 version of the measure (for "arrogant lobbying" as a result of the incident involving Sen. Case, R., S. D.).

The President obliged and, at a news conference in late February, announced that the Texas incident "had not changed my mind on the merits (of the gas bill) whatsoever. . . . That, to my mind, hopefully, is an isolated incident that will never be repeated."

There were reports that among the discussions the President had on the bill before making this statement was one with former Treasury Secretary George Humphrey during a Presidential vacation at Mr. Humphrey's Georgia plantation. According to the unsubstantiated reports, Mr. Humphrey's advice was given by quoting an old cliché to the effect that everyone's entitled to one mistake (Kelly's had his beer), and that if no further problems of the Texas-Case nature come up, the President should support the bill.

After that general Presidential endorsement, the gas bill backers hoped he would follow up by commenting favorably on the coal amendment compromise worked out between the coal and gas industries.

The bill's backers were generally agreed that the measure would have to come to a vote in the House—and pass—by April 1 in order to clear Congress this year. While they weren't expecting any real trouble getting the measure through the Senate if it passed the House, it would take time.

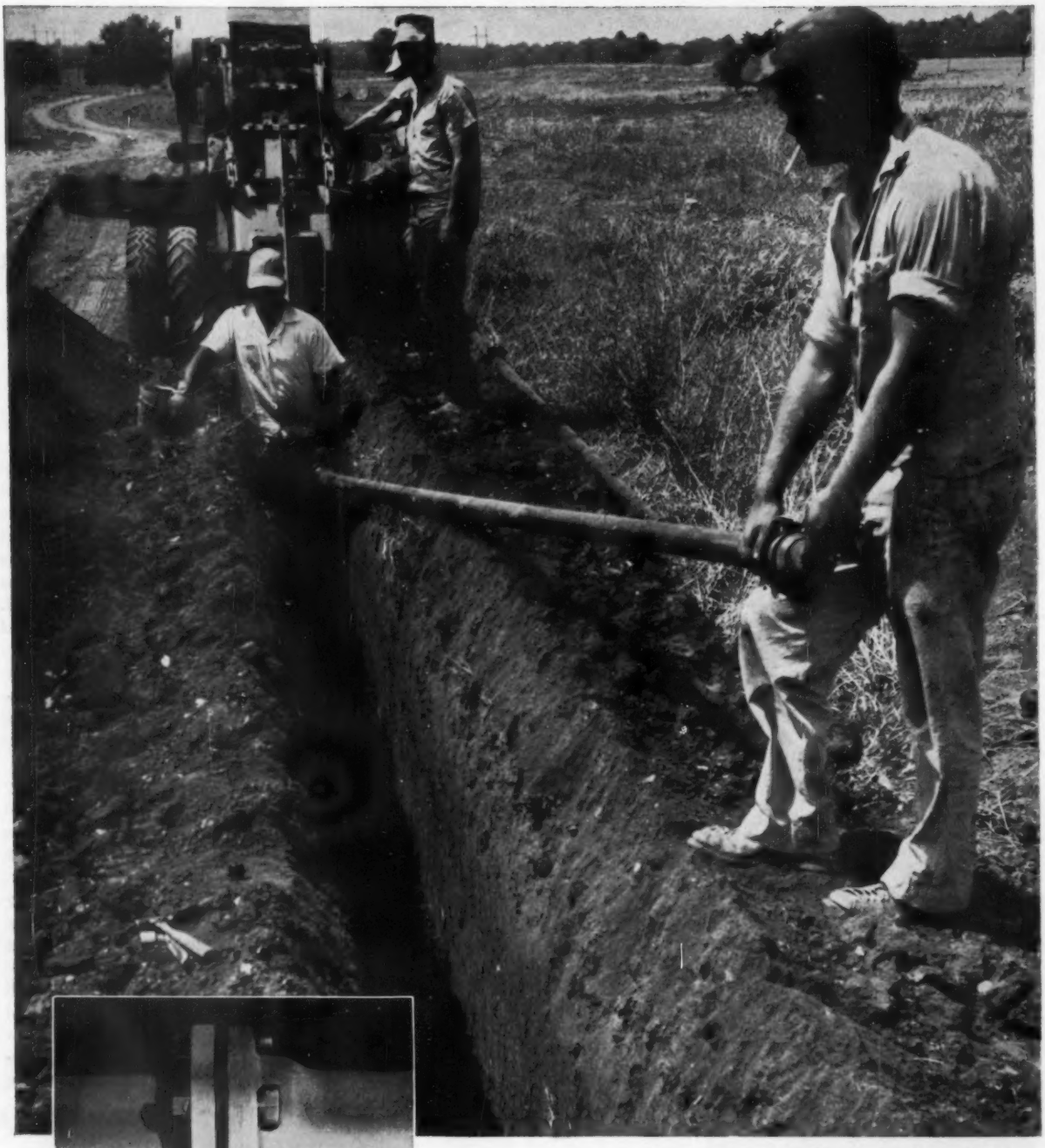
Long Senate hearings would have to be held and, with unlimited debate permitted on the Senate Floor, delaying tactics could be expected from opponents, even though they would be a clear minority.

Meanwhile, gas distributors will have to wait until next fall to find out how long they'll keep their new "seat at the bargaining table" which the Memphis decision has provided.

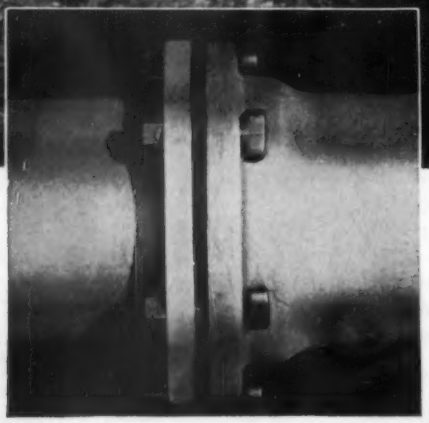
There is some disagreement reported in Washington among the distributors whether they want to keep the veto power over pipeline rate increases provided by the Memphis decision.

Some distributors have report-

Continued on page 160



Installing a Cast Iron Pipe gas line for a subdivision in booming Huntsville, Alabama.



CAST IRON

Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, Suite 3440, Prudential Plaza, Chicago 1, Ill.

MECHANICAL JOINT cast iron

the first 100 years are the easiest

dependable Cast Iron Pipe is built to last

Every year more gas companies join the Century Club, that unique organization whose membership is limited to water and gas companies whose cast iron mains have served communities a century and more.

57 American gas companies now belong. Hundreds more can point to mains with over fifty years of service.

And *modern* cast iron pipe, centrifugally cast, is even tougher . . . gives even greater promise of service.

Specify cast iron pipe and dependability, strength and long term economy make the first hundred years easy.

A FEW OF THE 57 GAS UTILITIES WITH CENTURY-OLD CAST IRON MAINS IN SERVICE

Baltimore Gas and Electric Company, Baltimore, Maryland — Citizens Utilities Company, Gas District, Bangor, Maine — The United Gas Improvement Company, Bethlehem, Pennsylvania — Boston Consolidated Gas Co., Boston, Massachusetts — Public Service Electric & Gas Co., Bound Brook, New Jersey.

MODERN CAST IRON PIPE IS EVEN MORE EFFICIENT

- **Centrifugally cast, it's tougher, stronger, more uniform.**
- **Standardized mechanical joints are bottle-tight under all gas distribution pressures . . . for all types of gas.**
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- **Joint design allows deflection during and after installation.**
- **Service lengths and variety of standard fittings cut time and labor in congested undergrounds.**

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Made of malleable iron. Single massive bolt. All sizes, 1/2" to 12" inclusive. For steel, cast iron and Transite pipe.

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SKINNER-SEAL SERVICE SADDLE

Edited by MARSHALL E. PARKER

A look at today's asphalt pipe enamels

By Lloyd F. Bramble, President
Gulf States Asphalt Co.
South Houston, Texas

PART 2

ADHESION is determined in several ways, one of which is by use of a tensiometer. Metal discs are placed ½ in. apart and the space filled with asphalt enamel. After cooling and aging, the discs are placed in tension to failure.

The nature of the separation—whether a flat fracture or one involving considerable elongation—is equally informative as the force required. At the same time, performance values of primers of various formulations can also be determined. Note in *Fig. 1* that a force of 625 psi resulted in a semi-stripping of the asphalt enamel. However, if the metal is primed before applying the identical enamel, the adhesion is increased by more than 75 per cent, to the degree that adhesion exceeds cohesion. As can be seen, the rupture occurred within the enamel itself, preserving intact the continuity of protection over the metal.

It is necessary that we know prior to this test whether the asphalt residual had been cracked during refining. This is determined by oliensis or spot test, which reveals the amount of free carbon left in the material (*Fig. 2*). Most experts agree that an excess of free carbon reduces performance both above and below ground. If any free carbon is revealed, the basic asphalt product is immediately discarded insofar as pipe coating usage is concerned.

Flexibility is determined by impact as well as other methods of test. (Since cold weather increases brittleness in an inherently brittle product, resistance to disbonding and cracking should be more than ample.)

Enamels of known performance values are impact tested and results charted. Performance of specimen enamels is correlated with these known values revealing, in exceptional detail, the probable performance of the enamel under conditions of rapid backfill, soil stress, earth heave, lineal expansion of the line,

Turn to page 30

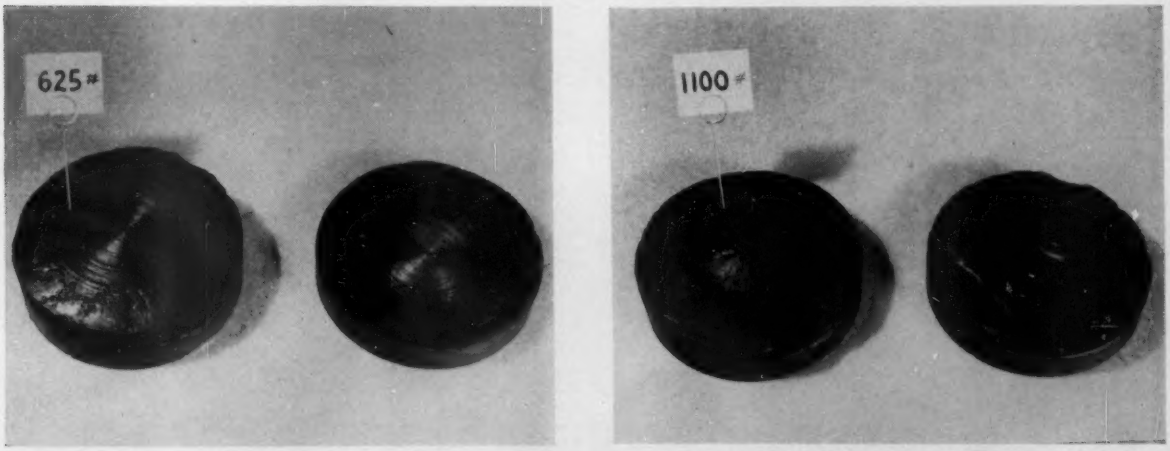
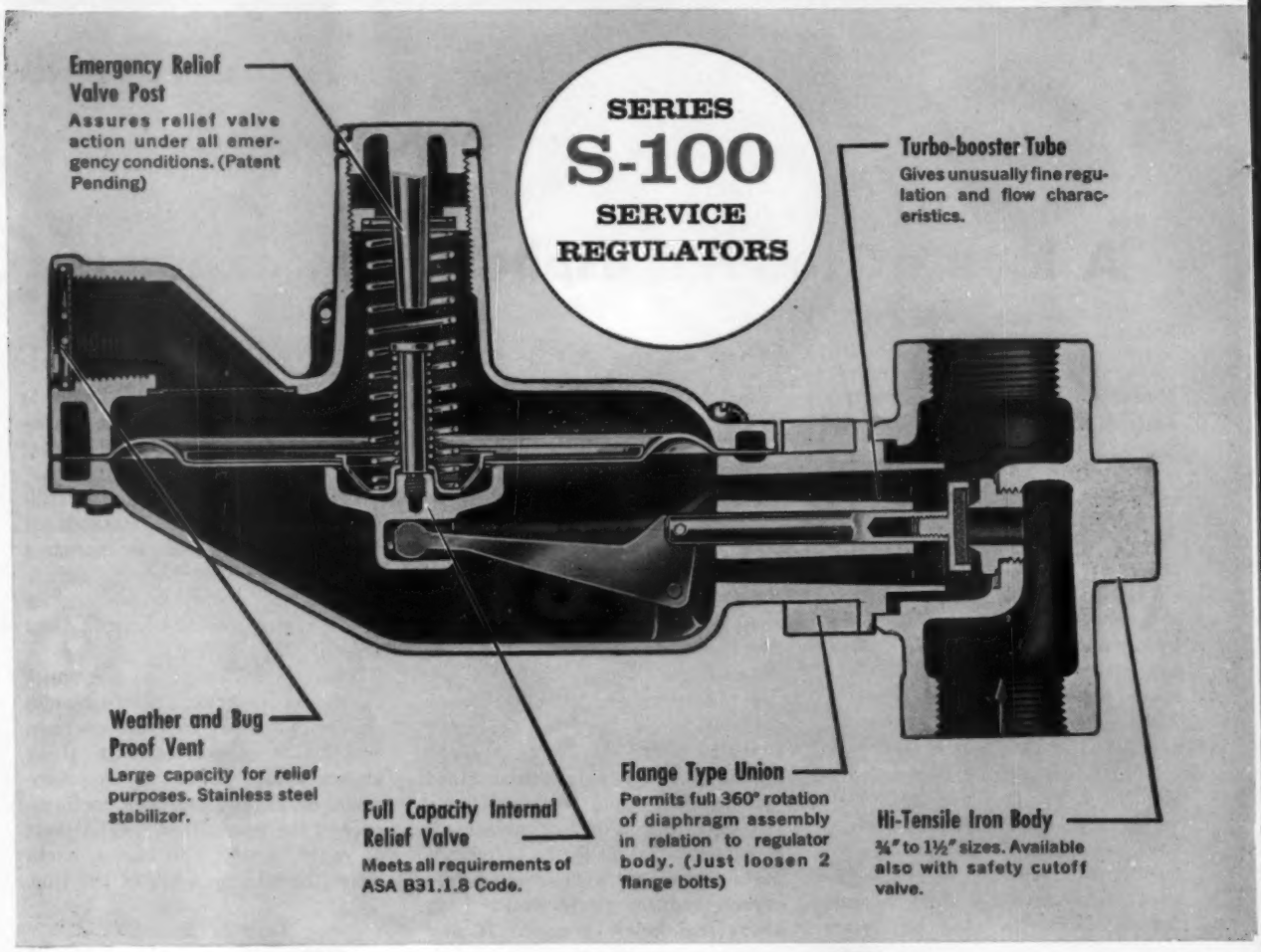
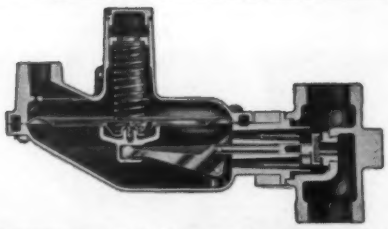


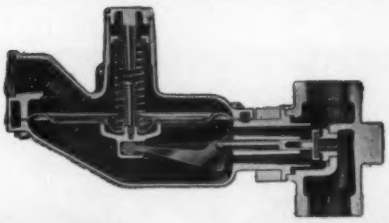
Fig. 1. Primer efficiency is graphically demonstrated here. A force of 625 psi stripped a portion of the enamel from unprimed metal surface. With a good primer applied over metal, the identical enamel then required 75% more force to effect a rupture. Separation occurred within enamel itself, leaving intact a continuity of enamel over metal.

Why FISHER Service Regulators are

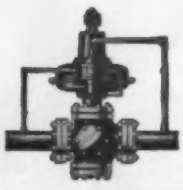

SERIES
S-100
SERVICE
REGULATORS
Emergency Relief Valve Post
Assures relief valve action under all emergency conditions. (Patent Pending)
Turbo-booster Tube
Gives unusually fine regulation and flow characteristics.
Weather and Bug Proof Vent
Large capacity for relief purposes. Stainless steel stabilizer.
Full Capacity Internal Relief Valve
Meets all requirements of ASA B31.1.8 Code.
Flange Type Union
Permits full 360° rotation of diaphragm assembly in relation to regulator body. (Just loosen 2 flange bolts)
Hi-Tensile Iron Body
¾" to 1½" sizes. Available also with safety cutoff valve.



SERIES S100-1—Standard House Service Regulator in ¾", 1", 1¼" and 1½" sizes. Inlet pressures up to 100 psi. Various outlet pressure ranges and vent arrangements available.



SERIES S102-4—Safety Type House Service Regulator with full capacity relief valve. This assembly capable of preventing downstream pressure from rising above safe levels even though the regulator section should be caused to fail in the wide open position.



IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD . . . CHANCES ARE IT'S CONTROLLED BY . . .

the most widely accepted in the Industry

Completely rotatable—full 360° rotation of diaphragm assembly in relation to regulator body.

Full capacity internal relief on S102 and S106 Series—built-in relief valve automatically opens should the house service pressure exceed a safe value.

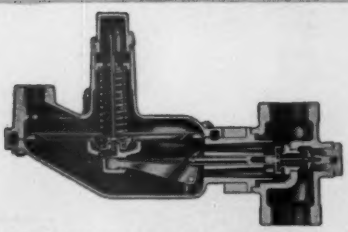
Available in 4 vent sizes—¼", ⅜", ½" and ¾" FPT venting available for the utmost in vent piping flexibility.

Fisher Series S100 regulators have unusually fine regulation and flow characteristics due to a new type turbo-booster tube. The range of capacities in the S100 Series meets all house service requirements with straight-line constant pressure control.

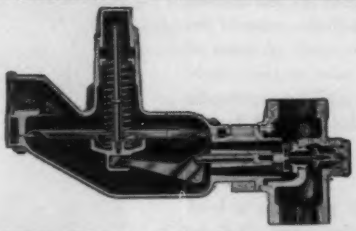
Fisher has built an improved aircraft two-bolt flange type union connection between body and diaphragm assembly. This means you can disassemble the S100 easily. Valve discs and orifices are renewable without breaking any pipe joints. In addition, you simply loosen the two bolts to rotate the diaphragm assembly to any desired position with respect to the body.

The Fisher S100 is rapidly becoming the most used house service regulator in America.

A complete, descriptive, illustrated bulletin on the Fisher S100 is yours for the asking. Write today for Bulletin Number P-S100.



SERIES S104—Safety Type House Service Regulator with auxiliary valve to close off flow completely in event inlet pressure falls too low, or the flow rate is excessive. Manually reset to resume service.



SERIES S106-4 — Safety Type House Service Regulator with auxiliary valve to close off completely in event inlet pressure falls too low. Manually reset to resume service. The full capacity relief valve prevents downstream pressures from rising above safe levels even though the regulator section should be caused to fail in the wide open position.

FISHER® Controls

SINCE 1880

FISHER GOVERNOR COMPANY

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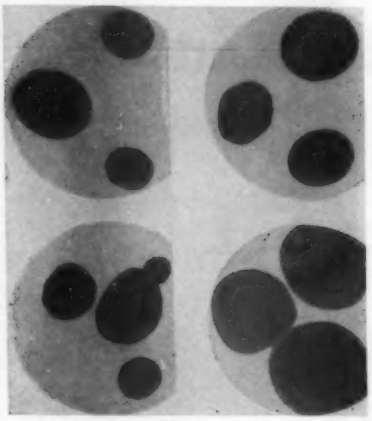


FIG. 2

A spot test has been developed by G. L. Oliensis through which medium it can be determined whether or not a residual product has been thermally cracked to the degree that synthetic resins and free carbon are developed within the product. Asphalts have extremely complex chemical and colloidal structures which are affected by changes in processing and refining. Thermal cracking develops bituminous fractions which yield products having many outward characteristics and qualities of the more familiar homogeneous types. Yet since they are made up of altogether different components it has been found that they behave differently in actual service. Leading authorities agree that the aging and weathering properties of bitumens are adversely affected by thermal cracking. Therefore, the Oliensis spot test becomes very important first to determine if thermal cracking has taken place and next the degree of cracking as determined by the amount of free carbon and synthetic resins in the resulting asphalt. As a result of years of study and practical tests, asphalt technicians immediately and automatically discard a cracked asphalt as unfit for the production of enamel for pipe protection purposes.

The Oliensis spot test prescribes in brief that a small amount of the asphalt under inspection be dissolved in a specified quantity of Stoddard naphtha solvent. After aging 24 hours a drop is released on a filter paper. If the asphalt is homogeneous such as indicated on the right hand specimen no free carbon is indicated. If, however, the asphalt has been thermally cracked in processing or refining, a heavy free carbon spot is formed within the outer ring of the specimen as indicated by the filter paper on the left-hand side.

and other mechanical stresses.

Next, the experienced asphalt technician makes one of the most important examinations in the entire series: surface appearance. Striking as it may seem, it is possible, through examination, to predict the origin of the crude from which the asphalt was extracted. Most important, the type of failure can be predetermined in many cases through this examination.

After acceptance of a given residual, it is "beefed" up, to increase cohesion, resistance to cold flow, to the mentioned mechanical stresses before, during and following backfill, and to thermal stresses.

Increased cohesive properties generally indicate an increased resistance to fractures at lower temperatures, a belief developed out of the theory of elasticity, and proven by practical tests. This beefing-up is achieved by fillers of a very special kind and size. Fillers of the wrong kind or shape will actually reduce ditch performance by creating interfacial tensions within enamel itself. Conversely, preventing internal stresses—a tremendously important job—is achieved with amorphous, finely divided fillers in the correct amount. The importance of proper selection of fillers is dramatically shown in the photo of the two weathered panels (*Fig. 3*). Bear in mind that the identical basic asphalt was used . . . the single difference is in the fillers used. The left-hand panel failed completely after six months of outdoor exposure. The enamel on the right-hand panel was photographed at the end of 18 months. Quite technically, the enamel on the right-hand panel had combined within it an amorphous-type non-stress-developing acid and alkaline-proof filler, the left-hand panel a crystalline-type filler, subject to creation of considerable internal stresses

Continued on page 158

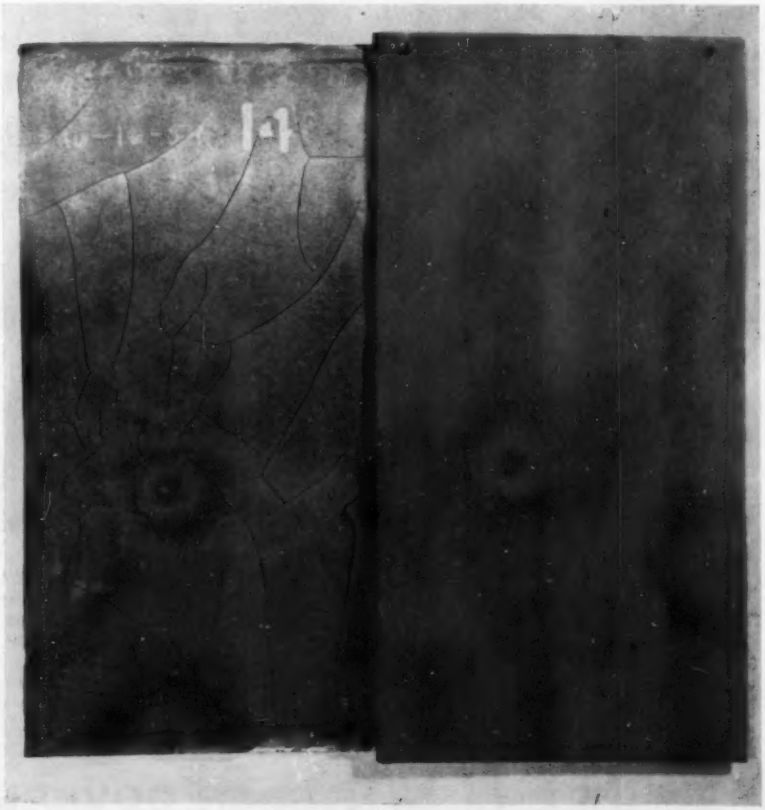


Fig. 3. Identical basic asphalts but different fillers. The specimen on the left was completely destroyed in six months of continuous outdoor exposure. The panel on the right was photographed at the end of 18 months. Internal stresses developed within the left-hand specimen due to selection of wrong type and size of fillers.

100,000 feet of trench in eight months on scattered jobs—that's what a Barber-Greene ditcher delivered for a Midwest utility company.

12 Barber-Greene ditchers travel 800 miles ... dig 100 jobs daily

To speed up house service installation, a Midwest utility, name upon request, bought three Barber-Greene Model 711 Ditchers. These ditchers paid off so well that nine more similar units with variations in boom design were soon added to meet the growing need for fast service trenching in the 250 different communities served by this progressive utility. This fleet of 12 has dug over 625,000 feet of trench in less than a year. As a result of this performance record, four more of these versatile ditchers have been added to the line—boosting the total to 16.

Here are some of the features of the Barber-Greene Model 711 ...

Unmatched mobility: Rubber-tired mounting provides fast job-to-job travel. Easy to drive, this Barber-Greene cruises at 45 m.p.h. . . . shrinks distances between jobs.

One-man operation: Once on the job, the operator merely lowers the boom and starts digging. Hydra-Crowd control permits infinite range of digging speeds from 0-13 feet per min.

Greater traction: . . . with four-wheel drive. An important feature when digging on slopes and hillsides or on soft, muddy ground that often surrounds new housing projects.

Saves lawns and curbing: Low bearing pressure and proper weight distribution offer real protection to lawns, sidewalks and curbing. Low height prevents entanglement with trees.

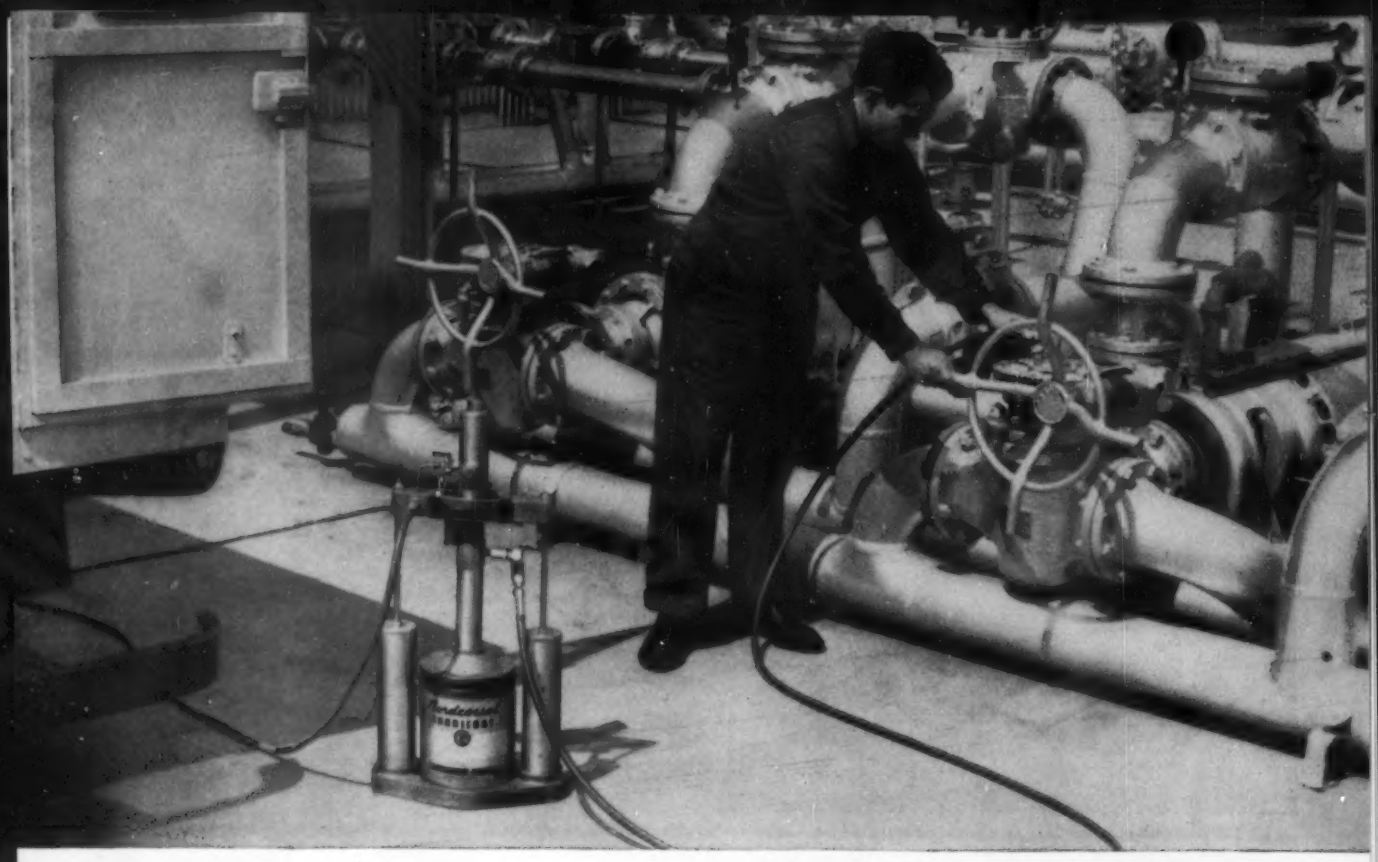
This is just one of five different Barber-Greene ditchers, each designed to cut costs on a wide variety of jobs.

Write for literature on the ditcher that saves time on the job and on the road. 56-18-D

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT



How valve lubrication

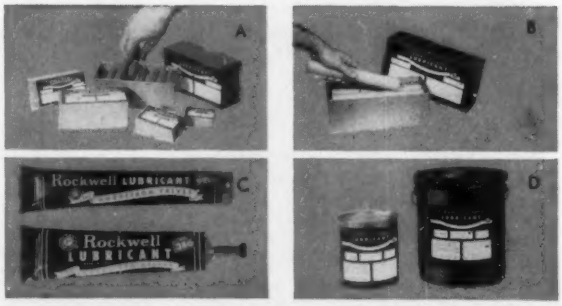
SAVES MONEY

For over forty years, operation cost studies have proved that Rockwell-Nordstrom lubricated plug valves perform better, yet cost far less to use, than ordinary valves. Here's why:

THE FUNCTION OF LUBRICANT is not just to make operation easier, but to form a leakproof, positive seal between the plug and valve body. Pressurized lubricant in the Sealdport grooves is actually a kind of "soft seat" that is instantly replaceable . . . it can't be *permanently* cut, worn or scratched like metal seats. Addition of new lubricant to a Rockwell-Nordstrom valve is like reseating an ordinary valve but it costs pennies instead of dollars.

Lubricant has another *very* important job in a Rockwell-Nordstrom valve. Acting as a "hydraulic" jack the pressurized lubricant provides a means of instantly unseating and freeing the plug . . . even after years in an open or closed position.

In any mechanism with moving parts, lubrication prevents wear and reduces friction. That's why Rockwell-Nordstrom valves work easier, stay in service longer and cost less to use. The information that follows shows equipment that will help you lubricate your valves more efficiently and at lower cost.

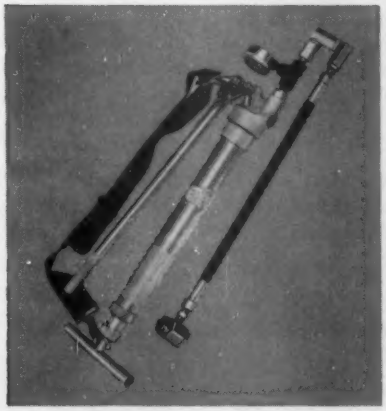


WORLD'S MOST COMPLETE LINE OF LUBRICANTS. Rockwell is the largest and oldest manufacturer of lubricated plug valve lubricants. Each lubricant is a result of painstaking research and careful field testing. A complete list of lubricants and the services for which they are recommended is available . . . use the coupon on the facing page.

The lubricant types illustrated above are (A) Stick Lubricants for manual insertion. (B) Stick Lubricants for lubricant guns, for fast, easy lubrication through the Rockwell fitting on the valves. (C) Gun Tubes for fast refilling of lubricant guns and convenient bulk tubes (spout type) for individual valve lubrication. (D) Bulk Lubricants in five quart and five gallon pails.

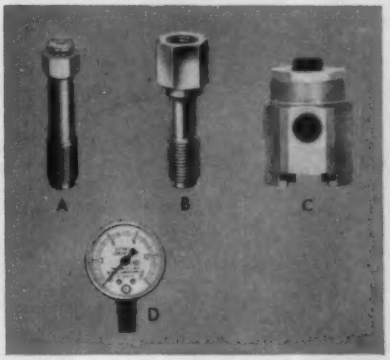
HAND LUBRICATION of a few small valves is done easily by unscrewing the Rockwell fitting with any standard wrench and inserting Rockwell stick lubricant. Screwing down the fitting creates proper lubricant pressure.

ROCKWELL HIGH PRESSURE HYDRAULIC HAND GUN is used at installations similar to those recommended for the booster gun. The Hydraulic Gun develops much higher lubricant pressures with less manual effort making it suitable for lubricating larger valves.



ROCKWELL BOOSTER HAND GUN provides high pressure lubrication for small or medium sized valves at installations where a moderate number of valves are to be maintained. Quickly loaded with stick lubricants, the hand gun is fast, easy to operate and insures proper lubricant pressure within the valve.

ROCKWELL HYPREGUN saves time and labor at large valve installations especially where there are numerous large valves. The Hypregun is a compact, self-priming air operated lubricant bucket gun. Using 5 qt. pails of lubricant, it's easy to properly service the largest valve installations.



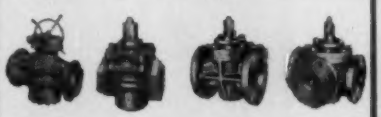
LUBRICATION ACCESSORIES. Just a few of the lubrication accessories available from Rockwell are shown above. The Rockwell Fitting (A) is now standard on all valves. The drilled and tapped lubricant screw (B) makes a convenient fitting for use with pressure gauges or gun fittings. The Rockwell 400 giant button head coupler (C) has a built-in shut-off to eliminate lubricant extrusion from residual pressure in the hose (the "400" is standard on all Rockwell guns and pumps). Pressure gauges (D) for hand guns and bucket pumps tell *automatically* when correct lubricant pressure is reached . . . also indicate when valve needs further gland adjustment.

How to Select Rockwell-Nordstrom Valve Lubricants

Complete details on the proper lubrication of Rockwell-Nordstrom valves and the proper lubricant formula number for a wide range of services are detailed in Rockwell Bulletin V-220. Generally, the following information is vital to the selection of the proper lubricant:

1. Precise description of the line material to be valved.
2. Temperature range to which valve will be subjected.
3. Pressure range within which the valve will work.
4. Size and type of Rockwell-Nordstrom valves.
5. Frequency of operation.
6. Type of lubricant (stick, gun tube, pail or bucket) to be used.

Rockwell's lubricant research staff will be pleased to give special attention to operating problems not specifically covered in the literature.



ROCKWELL-Nordstrom VALVES

it's **ROCKWELL** MANUFACTURING COMPANY

Rockwell Manufacturing Company
Pittsburgh 8, Pa.

☐ Please send me Rockwell Bulletins V-218 and V-220.

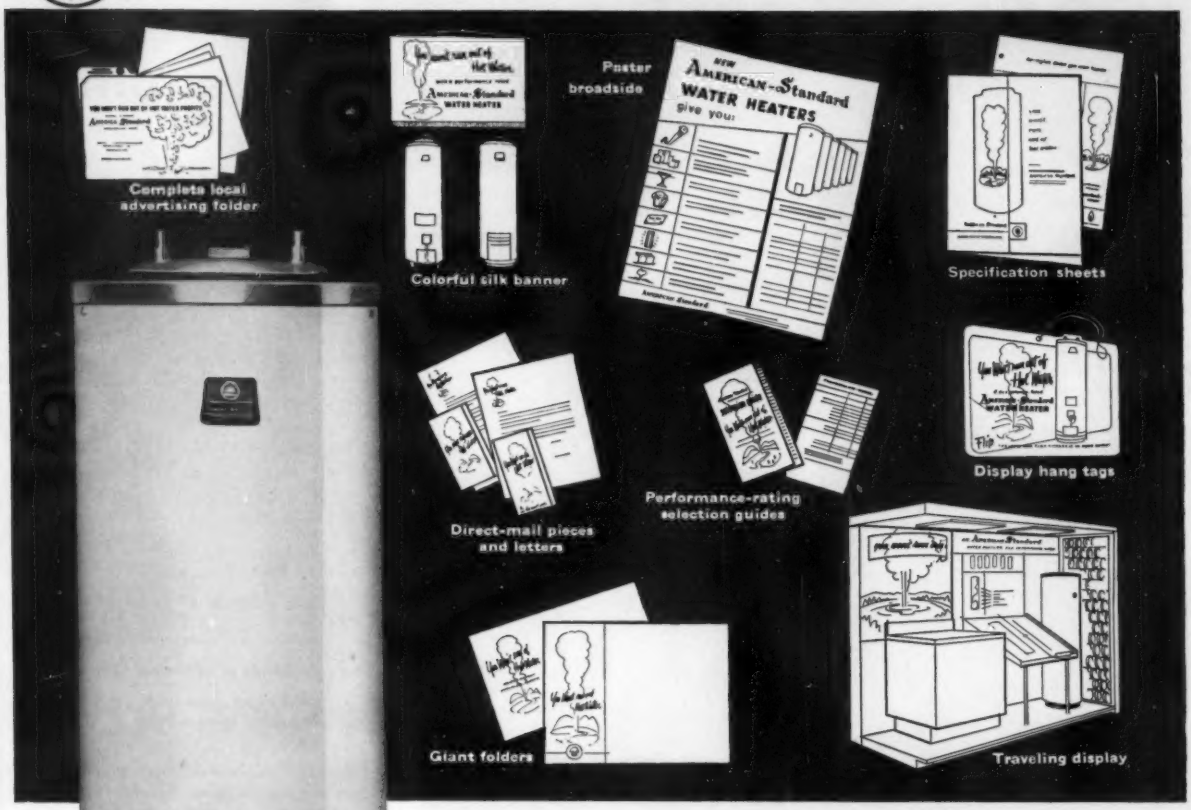
☐ Please have your sales representative call to discuss specific problems.

Name_____

Address_____

City_____ Zone_____ State_____

High-recovery water heaters boost load



And here's how American-Standard helps you promote more water heaters

Dramatic merchandising aids from American-Standard do a big job in helping utilities put more water heaters into homes. These aids are built around the practical promise, "You won't run out of hot water." Big bright banners, broadsides and product tags put sell into showroom displays. Exciting mailings bring in prospects. Simple-to-use performance-rating charts dramatize need for right-size water heater —make sizing and selling easy. Here's a campaign that sells gas by selling the high-recovery water heaters that are better load-builders —cost your customers less per gallon.

The new, complete line of American-Standard water heaters includes many sizes, de luxe and budget models, choice of glass-lined or galvanized steel tanks. Get the profitable details now.

American-Standard" and "Standard" are trademarks of American Radiator & Standard Sanitary Corporation

For any home—no matter how much hot water is needed—there's an American-Standard water heater that's ideal.

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40 W. 40th Street, New York 18, N. Y.

FREE ☐ Send free 50 gas water heater selection guides
☐ Have a representative stop in to see me

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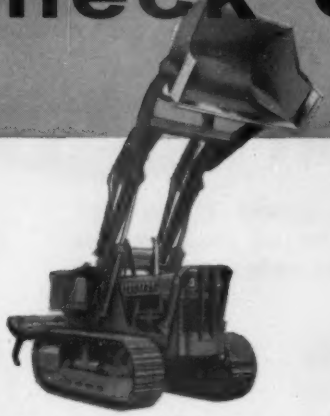
AMERICAN-Standard
PLUMBING AND HEATING DIVISION

Before you buy any tractor equipment...

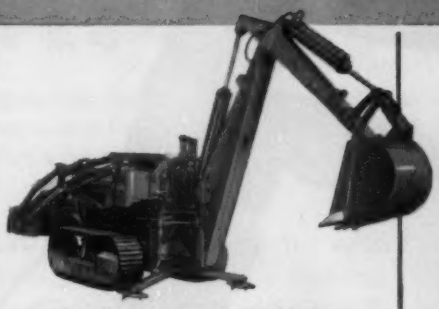
Check Case® TerraTrac®

PRICE AND PERFORMANCE!



Crawler-mounted loaders

Five sizes — ½ to 2-cu yd. — with exclusive "knock-out" dumping action, plus improved bucket rollback. Extra-high dump clearance simplifies loading high trucks and hoppers.

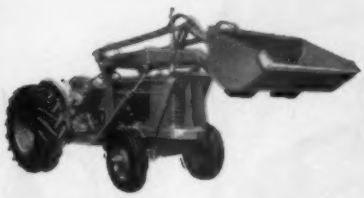


Crawler-mounted backhoes

Exceptional power and stability for tough digging in hard ground, steep grades, etc. Digs 12½' below grade. Available with various dipper sizes and optional front-end loader or dozer.

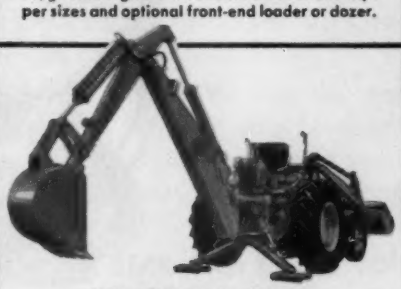
Crawler fork lift

Keeps jobs moving in any weather or terrain. Unloads trucks . . . carries, lifts materials to 21'4" height. Mounts quick-change loader, dozer, concrete bucket, log-grab, or crane hook.



Wheel-type loaders

Beats any ½-yd. loader you ever saw for light loading, backfill and clean-up. 100% Case-engineered, Case-built, with heavy-duty lift-arms and automatic power-leveling.

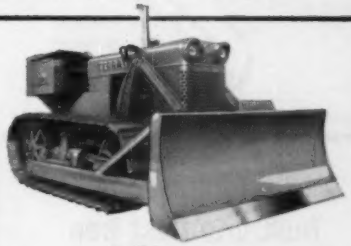


Wheel-type backhoes

Lowest-priced combination backhoe-loader on the market. Heavy-duty industrial design, with hydraulic foot-controlled 180° swing, telescoping stabilizers, many other advanced features.

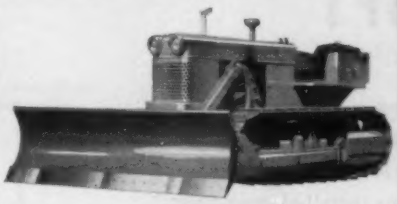
Rubber-tired prime-movers

Three economical sizes — 42, 60 and 100 HP —with high-torque Case engine for operating mower, grader blade, etc. Also ideal for miscellaneous winching and drawbar work.



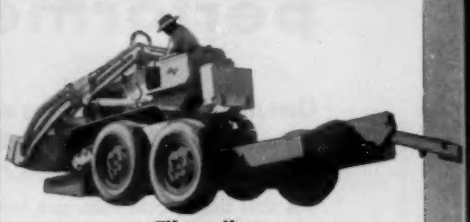
Bulldozers

Seven low-cost models under 80 HP — four with torque converters — plus larger sizes up to 100 HP, with max. 24,000 lbs. drawbar pull. Largest models feature optional "power-tilt."



Angledozers

Eleven gasoline and diesel-powered models from 42 to 100 HP. Largest models have torque-converter drive, instant power-shift, power steering—plus exclusive "power-angling" blade.



Tilt-trailers

4 or 8-ton capacity. Easily loaded or unloaded by one man. Available at saving of $500 to $1000 under competitive trailer prices with purchase of new TerraTrac crawler.

Maybe you didn't realize it . . . but J. I. Case Company now builds the *most advanced* line of industrial tractors and equipment of any single manufacturer in the 40 to 100 HP range. You can choose from a complete family of new Case-built prime-movers — *both wheel-type and crawlers* — plus a full line of matching loaders, bulldozers, backhoes, fork lifts and trailers. There's a rig for every need and budget — with just *one warranty, one service source, one easy financing arrangement,* on each complete machine. See your nearest Case Industrial Dealer for full details.

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☐ Crawler loaders ☐ Crawler backhoes ☐ Fork lift
☐ Wheel loaders ☐ Wheel-type backhoes ☐ Rubber-tired prime-movers ☐ Bulldozers ☐ Angledozers ☐ Tilt-trailers

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top performer!

Cast iron pipe keeps setting new highs for long life, dependability, economy. Literally hundreds of America's leading gas companies are still using cast iron gas mains installed over fifty years ago. Fifty five are still going strong with mains that have served a century or longer. And today's modernized cast iron pipe, centrifugally cast, is even stronger, more durable, more uniform.

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DATA SHEET NO. 2

Short Form Guide to Selecting the Proper

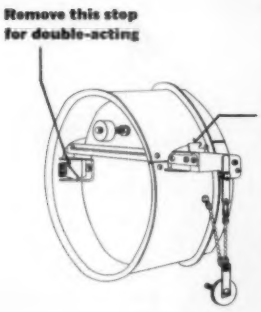
Field TRIPLE-FUEL M+MG2

The Field M+MG2 is a triple-fuel control providing equally precise draft regulation for solid fuels, oil, gas, or oil-gas, and requiring only the simplest, on-the-job adjustments when fuels are changed. It is a heavy duty control, in sizes 10″ through 32″.

APPLICATIONS: Specify for solid fuels, oil, gas or oil-gas furnaces and boilers, with natural, induced or forced draft. In a gas installation, specify the M+MG2 instead of a draft hood in order to give the appliance the assistance of the chimney. Gas installations need a moderately strong draft, and a draft diverter, by its very nature, reduces the draft in breeching or flue to essentially zero.

WHAT TO SPECIFY: For oil, gas, or oil-gas, specify the standard M+MG2. It will be shipped as a single-acting oil control. The simple adjustment required for gas will be made during installation. For solid fuels specify the Field M+MG2 Barochek.

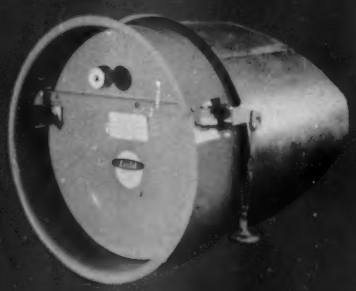
CHOOSING SIZE AND LOCATION: See tables and sketches on reverse side. Note that where two or more boilers connect into one chimney a draft control should be installed on each individual branch or uptake, so that different drafts can be maintained at each boiler outlet if necessary.



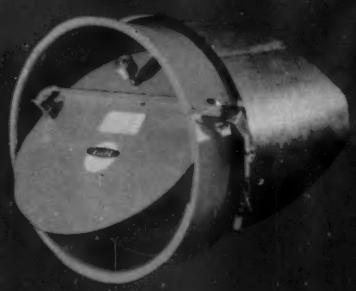
Drawing shows simple stops removed to permit single-acting M+MG2 to become double-acting.

Remove and file for reference.

for easy tear-out.



M+MG2 Single Acting for Oil



M+MG2 Double Acting for Gas, opens inward to regulate up drafts, and opens outward to relieve internal pressures.

M+MG2 Barochek for Solid Fuels

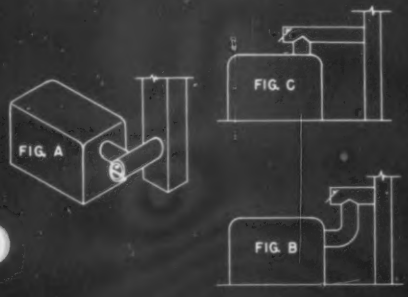
SPECIFICATION DATA — FIELD TRIPLE-FUEL M+MG2

APPROVALS: The M+MG2 is Listed by Underwriters' Laboratories as a single acting control for solid fuels and oil, and as a double-acting control for gas. America's leading gas utilities have approved and are actively recommending the use of Field Draft Controls.

PHYSICAL DIMENSIONS: Dimension drawings and tables for all sizes of the M+MG2 appear on the Field Data Sheet No. 1, in January issues of Heating, Piping & Airconditioning, and Gas Age, and February issues of Airconditioning, Heating & Ventilating, and Gas magazine.

Data Sheet No. 3 will answer the question: "Why Specify a Field Barometric Draft Control for Gas?"

BEST LOCATIONS FOR GAS



BEST LOCATIONS FOR OIL OR SOLID FUELS

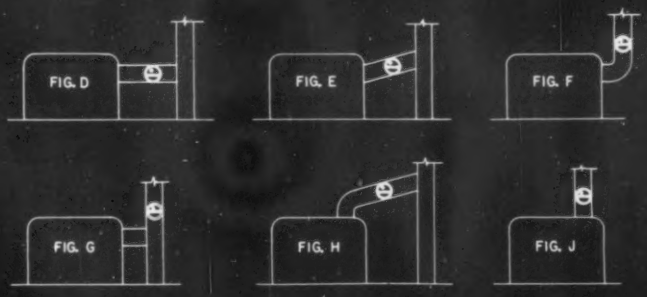


TABLE ONE — GUIDE FOR SELECTING CORRECT SIZE M+MG2 CONTROL FOR OIL-FIRED OR COAL-FIRED PLANTS

DIAMETER OF FLUE or Breeching	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL
12"	20' or less	10"	21—30'	12"	31— 55'	14"
13"	20' or less	12"	21—40'	14"		
14"	20' or less	12"	21—35'	14"	36— 60'	16"
15"	30' or less	14"	31—45'	16"		
16"	25' or less	14"	26—40'	16"	41— 70'	18"
17"	35' or less	16"	36—50'	18"		
18"	30' or less	16"	31—45'	18"	46— 65'	20"
19"	40' or less	18"	41—55'	20"		
20"	35' or less	18"	36—50'	20"	51—100'	24"
21"	40' or less	20"	41—85'	24"		
22"	35' or less	20"	36—70'	24"		
23"	30' or less	20"	31—60'	24"		
24"	30' or less	20"	31—55'	24"	56—100'	28"
25"	50' or less	24"	51—85'	28"		
26"	40' or less	24"	41—75'	28"		
27"	35' or less	24"	36—70'	28"		
28"	35' or less	24"	36—65'	28"	66—100'	32"
29"	55' or less	28"	56—95'	32"		
30"	50' or less	28"	51—85'	32"		
31"	45' or less	28"	46—75'	32"		
32"	40' or less	28"	41—70'	32"		
33"	60' or less	32"				
34"	55' or less	32"				

TABLE TWO — GUIDE FOR SELECTING CORRECT SIZE M+MG2 OR MG1 CONTROL FOR GAS-, OR OIL-GAS FIRED PLANTS

DIAMETER OF FLUE or Breeching	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL
7"			35' or less	8"		
8"			25' or less	8"		
9"	15' or less	8"	16—40'	10"		
10"			30' or less	10"	31— 50'	12"
11"	20' or less	10"	21—42'	12"		
12"	20' or less	10"	21—30'	12"		
13"	22' or less	12"	23—70'	16"		
14"			55' or less	16"		
15"			45' or less	16"		
16"			40' or less	16"		
17"	35' or less	16"	36—90'	20"		
18"	30' or less	16"	31—75'	20"		
19"			60' or less	20"		
20"			36—50'	20"	51—100'	24
21"	40' or less	20"	41—85'	24"		
22"	35' or less	20"	36—70'	24"		
23"	30' or less	20"	31—60'	24"		
24"	30' or less	20"	31—55'	24"	56—100'	28"
25"	50' or less	24"	51—85'	28"		
26"	40' or less	24"	41—75'	28"		
27"	35' or less	24"	36—70'	28"		
28"	35' or less	24"	36—65'	28"	66—100'	32"
29"	55' or less	28"	56—95'	32"		
30"	50' or less	28"	51—85'	32"		
31"	45' or less	28"	46—75'	32"		
32"	40' or less	28"	41—70'	32"		
33"	60' or less	32"				
34"	55' or less	32"				

Chimney height is measured from floor of boiler room. If **very low draft** must be maintained, use control one size larger. If **very high draft** will be necessary, a control one size smaller may be used.

FIELD CONTROL DIVISION

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Deliveries are prompt, firm competitive prices too, and **acf** quality is way out ahead. Consider these extra features over and above basic code requirements:

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- Exclusive Uni-Formed Advanced Design Flued Manway...the only manway construction permitting complete radiography of manway welds.
- Steel-grit-blasted before prime painting for lower maintenance costs on aboveground installations, a *must* on underground installations.
- Hot formed heads for more accurate fit-up.
- Can be equipped with integrally welded steel saddles for flat concrete pier mounting.
- All tanks certified by Hartford Steam Boiler Inspection and Insurance Company.

Guaranteed delivery this spring at firm prices. Ask your LP gas consultant to specify **acf** Propane Storage Tanks and **acf** Safety Relief Valves. Get in touch with your nearest Advanced Products office. Advanced Products, Division of **acf** Industries, Incorporated, Dept. 4-G, 30 Church Street, New York 8, N. Y. Sales Offices: New York–Milton, Pa.–St. Charles, Mo.–Chicago.

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BECAUSE we are the newest pipe manufacturers our reputation is on trial with every piece.

We keep yield points, tensile strengths, and elongations well above the minimum.

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"SCOTCHRAP" Brand Pipe Insulation is tough Polyvinyl Chloride Plastic Tape in roll form. *Sticks* at a touch and *stays* where it's put. Because it is so extremely rugged, so highly conformable, and so easy and convenient to apply, it is recognized as the leader in versatile, high-quality pipe protection. And "SCOTCHRAP" is easy to use . . . gives you complete corrosion protection immediately, without costly preparation, special tools, or dangerous flames. For better jobs, in less time, at less cost, always specify "SCOTCHRAP" Pipe Protection. Available in seven standard widths from 1 inch to 18 inches. *Made by the makers of* "SCOTCH" *Brand No. 33 Electrical Tape.*

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See how versatile!

WELDED SEAMS on large diameter pipes are given practical, permanent protection by using wide widths of "SCOTCHRAP." Application is easy, fast, clean.

LONG LINES get a tough, continuous protective coating easily with "SCOTCHRAP." Use of a Betzel Tapester speeds the fast, smooth application.

JOINTS, elbows, curves are easily wrapped with strong, conformable "SCOTCHRAP." Quick and clean to apply. High holding power . . . *stays* where it's put!

SEND FOR FREE BOOKLETS describing protective qualities and easy application of "SCOTCHRAP." Write on your letterhead to: 3M Co., St. Paul 6, Minn., Dept. EU-97.

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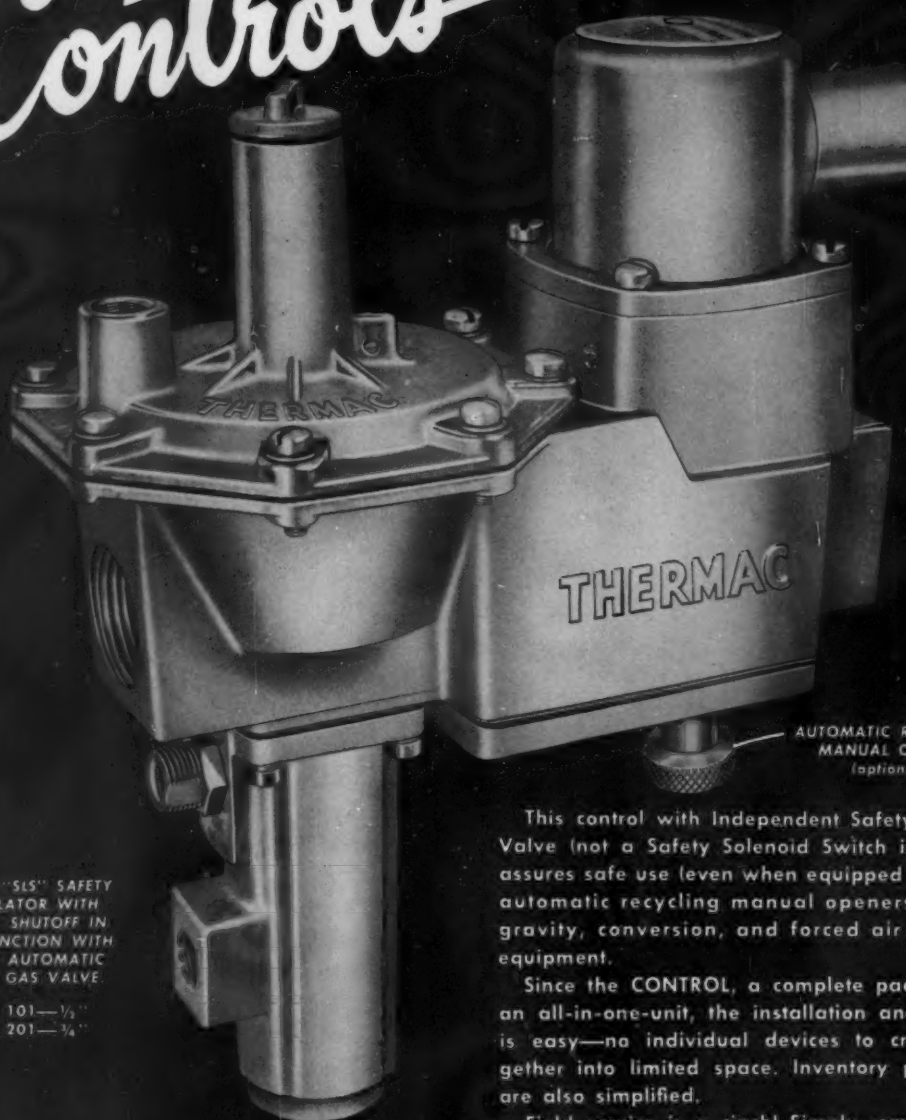
MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

SAVE THREE WAYS WITH THERMAC SLS

COMBINATION

Controls



AUTOMATIC RECYCLING MANUAL OPENER (optional)

SERIES "SLS" SAFETY REGULATOR WITH 100% SHUTOFF IN CONJUNCTION WITH QUIET AUTOMATIC MAIN GAS VALVE.

SLS 101—⅓"
SLS 201—¾"

This control with Independent Safety Shutoff Valve (not a Safety Solenoid Switch in series) assures safe use (even when equipped with the automatic recycling manual openers) on all gravity, conversion, and forced air heating equipment.

Since the CONTROL, a complete package, is an all-in-one-unit, the installation and piping is easy—no individual devices to crowd together into limited space. Inventory problems are also simplified.

Field service is a cinch! Simply remove four screws to dismantle either the safety or solenoid head. Why not check the THERMAC MODEL SLS on your furnaces immediately. You'll enjoy top performance and save three ways: installation time, installation space, and overall control cost. Send for prices and delivery.

THERMAC

HM COMPANY

Certified by A.G.A.

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Modern method of service replacement

There's no trenching with tubing of Tenite Butyrate

Plastic tubing of Tenite Butyrate is the fast, economical way to replace corroded metal services. Trenching is eliminated. You merely dig two holes: one at the gas main tap, the other at the service riser. Tubing of Tenite Butyrate is then run right through the old pipe. Since its smooth walls create less friction than metal tubing, pressure is unaffected by the resulting slight decrease in diameter.

Tubing made of Tenite Butyrate has other advantages too: It is amazingly light in weight; an average service of 70 feet weighs less than four pounds. Connections are made between tubing and metal pipe

with simple adaptors. What's more, the tubing is unaffected by corrosive or electrolytic action of soil—your assurance of many years of trouble-free service.

Over a decade of use has proved the many advantages of Butyrate over metal for natural gas service. Nearly three million feet of this plastic tubing have already been installed by one company alone. *Tenite Butyrate has also been used by several progressive utilities as a material for mains.* Find out more about this modern approach to natural gas distribution. For information about tubing made of Tenite Butyrate, its fittings and installation, plus the names of suppliers near you, write: EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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A 16mm. sound-color film, "Plastic Pipelines," is available upon request.

SIE

Compressor Start Unit.....

A new Dresser Industries contribution toward a *FULLY AUTOMATIC PIPELINE!*

By installing SIE Compressor Start Units in present, and building, compressor stations, far-sighted pipeline operators are taking advantage of an important short-cut toward full automation of their pipeline systems. Because these units are specifically designed for use with the SIE Compressor Station Computer-Controller and auxiliary automatic control equipment, their installation will *advance the full automation of a gas pipeline by many months* . . . and provide greatly increased compressor station efficiency and equipment protection in the meantime.

As modern pipeline systems are being equipped for completely automatic production scheduling, transferring, and dispatching in the coming months, the Compressor Start Units will be in daily operation . . . *automatically* handling the entire sequence of compressor starting and stopping operations.

Contact the SIE Control Division for full information on the application of automatic control equipment to pipeline operations, and be sure to plan on Compressor Start Unit installations at every station as part of your 1958 equipment program.

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And it's a BIG tractor! 49 engine hp delivers over 5,800 pounds pull at the drawbar, or similar push for dozing. There's up to 1,000 pounds greater built-in weight than usual to tractors of this power class. This greater strength means *stamina* to stay on the job in the most rugged service. Power steering is available optionally to give you top driving ease.

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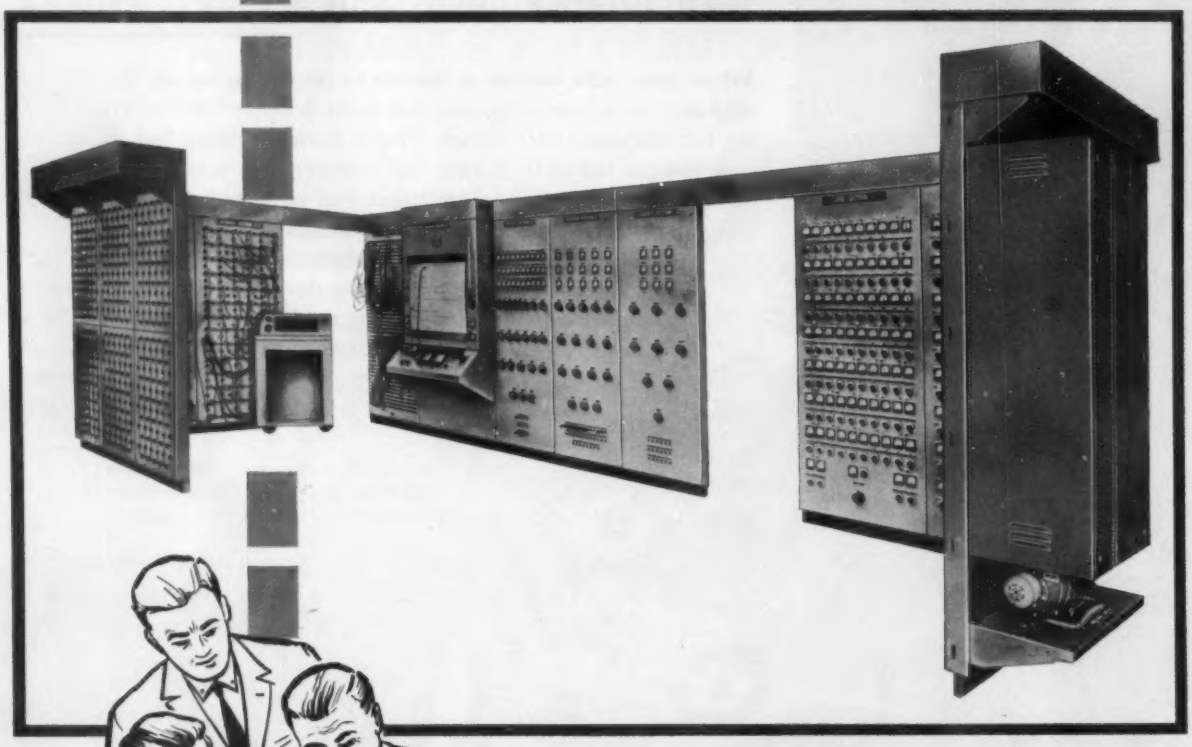
how do YOU handle

SYSTEM ANALYSIS?



By careful calculations utilizing fully your engineering training and experience? Or does the pressure of time dictate using "seat of the pants" methods?

With greatly increased work loads . . . continuing population growth . . . and rapid development of suburban areas . . . most engineering departments are hard pressed for time to make adequate, accurate system analysis.

To overburdened engineering departments, the McIlroy Fluid Network Analyzer . . . by STANDARD . . . has been a lifesaver! *Accurate, complete* system analysis that would require *days* of engineering effort is completed in *hours*.

And only with the McIlroy Analyzer can you test your plans *in advance* . . . have a *visual* representation of system condition . . . protect against a wrong guess that can be so costly in materials, time, and labor.

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In the spots that count... Homestead Valves are

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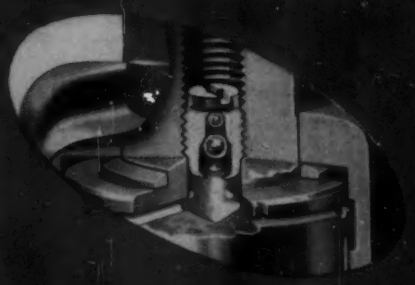

Reinforced Teflon* seal and lubricant seal

Controlled pressurized lubricant seal

Lower cost per year valve service is guaranteed by Homestead Lubricated Plug Valves. These are the features that make them leakproof and extend their useful life . . . reinforced Teflon* head seal, double ball and lubricant sealed check valve, and their exclusive controlled pressurized lubricant seal.

Homestead's controlled lubricating system forces a chemical film over all sealing surfaces at more than 300 pounds pressure. In addition, it prevents sticking, by its piston-like movement of the plug during each lubrication. See how Homestead fills your valve needs. Write today for Reference Book 39, (Section 5), for complete information on Homestead Lubricated Plug Valves.

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Let United Engineers represent you on the job

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UTILITIES REPORT:

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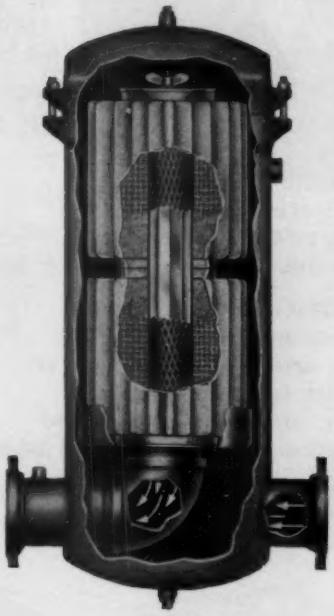
REMOVE DUST FROM NATURAL GAS PIPE LINES

Conversion to natural gas always means dust problems, *unless* proper filtration is provided in the district regulator valve chambers. Staynew Filters (model CPHG with the WRC-20 medium) provide exactly the desired filtration to completely eliminate your dust problems and thus reduce service calls and customer complaints.

For natural gas filtration, Staynew Filters are available in the widest range of sizes . . . pressures to 10,000 psi. . . . capacities to handle 100,000,000 cu. ft. or more per day.



STAYNEW MODEL CPHG GAS FILTER with the new WRC-20 Medium which removes particles 2 microns or less in diameter.

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SPECIALIZING IN DRY TYPE FILTERS FOR OVER 35 YEARS

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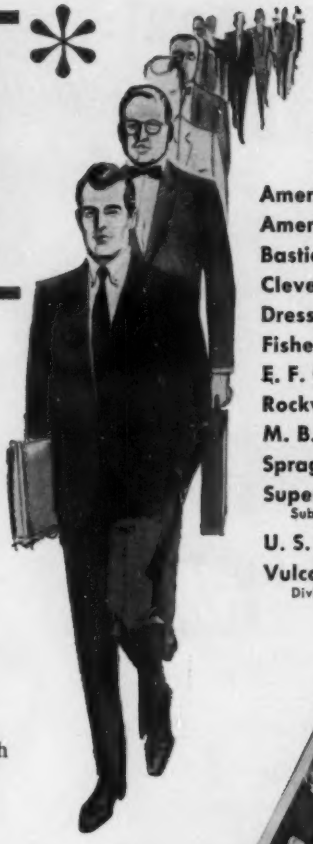
GEM*

promotes Gas Industry Growth



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Promoting the sale of GAS and of GAS appliances and equipment is the responsibility of everyone connected with the GAS Industry – utilities, LP-Gas Marketers, manufacturers and suppliers alike.

Again in 1958, members of GEM – the Gas Equipment Manufacturers Group are underwriting a national advertising program to help increase sales of GAS and of GAS appliances and equipment. These manufacturers are accepting their responsibility – standing up to be counted among those helping the GAS Industry grow and prosper.

All Suppliers to the GAS Industry are invited and urged to join the GEM Program and help insure the future of their business.

FREE reprints of Saturday Evening Post advertisements, for use by Gas Utilities and LP-Gas Marketers are available. GEM price tags, with room for appliance prices and terms can be obtained at $10 per 1000.

As the Gas Industry goes, so will go the business of everyone selling to it.

For full information, ask any GEM Sponsor or write:

***GAS EQUIPMENT MANUFACTURERS GROUP**
c/o Gas Appliance Manufacturers Association
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The new Superior ALUMINUM CASE METERS

. . . the slow-motion meters you can rely on longer

This slow-motion, long-lived meter operates at only 7 revolutions per cubic foot to reduce wear and stay accurate longer. And its simple, horizontal seam construction gives fewer chances for leaks . . . makes maintenance quick and simple. Whether it's adjusting the tangent through the handy access in the top . . . removing the top to grind the valve seat . . . or lifting out the valve table with the entire inner movement to replace the diaphragm, simply loosening a few screws makes everything accessible.

Get full details. Send for bulletin 1150.

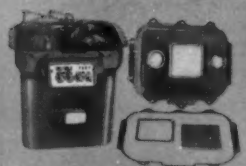
This modern meter exploits all the time-tested advances in meter technology *plus* the latest manufacturing techniques of Superior's new plant.

SUPERIOR METER COMPANY, INC.
19 West 50th Street, New York 20, N. Y.
A SUBSIDIARY OF NEPTUNE METER COMPANY

neptune

Look at these advanced design features:

1. Simple, horizontal seam . . . eliminates leakage . . . easier maintenance
2. Easily accessible table . . . just remove the screws holding top



3. Meter top removable without taking off index box
4. Valve seat readily accessible for grinding when top is removed
5. Slow movement; only 7 revolutions per cubic foot
6. Seam gasket stays resilient . . . cork and Buna-N composition
7. Valve table lifts out with entire mechanism

8. Heavy-duty, sintered bronze bearings oil-impregnated for life
9. Flag arrangement gives arm smoother operation and longer life
10. Accurately controlled diaphragm . . . no inaccuracies from deflection
11. Cupped handling lids permit easy and safe carrying
12. Handy access for tangent adjustment and calibration
13. Broad base for solid stacking . . . designed for conveyorized handling
14. Index removable without removing meter

In 250 cfh and 340 cfh sizes to meet most domestic requirements.

Men like EDDIE HULL make the difference!

Meet your best guarantee of Hill-Hubbell quality! His name is Eddie Hull, one of the hundreds of factory-trained craftsmen who make the Hill-Hubbell name synonymous with quality in the pipe coating and wrapping field!

It's easy to see that Eddie takes pride in a job well done! That's why Eddie and the men like him are the most valuable asset that Hill-Hubbell has! So, for skilled, conscientious craftsmanship in permanent factories where every operation is controlled—

Specify Hill, Hubbell wrapped pipe on your next job

HILL·HUBBELL & COMPANY

DIVISION OF GENERAL PAINT CORP. • 3091 MAYFIELD ROAD, CLEVELAND 18, OHIO

FACTORY APPLICATORS OF COATINGS AND WRAPPINGS

UP

AROUND

UNDER

. . . Dresser Couplings solve tough piping problems

Lining up new piping with old . . . vertically or horizontally . . . is a painstaking operation at best, but it's much simpler and quicker when time-proved Dresser Couplings are used to make the connections. The give-and-take inherent in the couplings compensates for slight misalignments and removes all stresses from the connected parts.

Snaking pipe and fittings under the maze of other piping in city streets . . . then joining it up . . . is many times faster and simpler with Dresser-Coupled joints. This is particularly true when it is necessary to deflect the pipes to dodge under or to the side of an obstruction.

In city distribution work, Dresser Couplings are famous for saving time, trouble, and expense for gas companies . . . not only in the tough spots shown here, but in *all* city work.

Why do it the hard way? Cash in on the all-around economy and convenience of the Dresser Coupling Way.

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MANUFACTURING DIVISION
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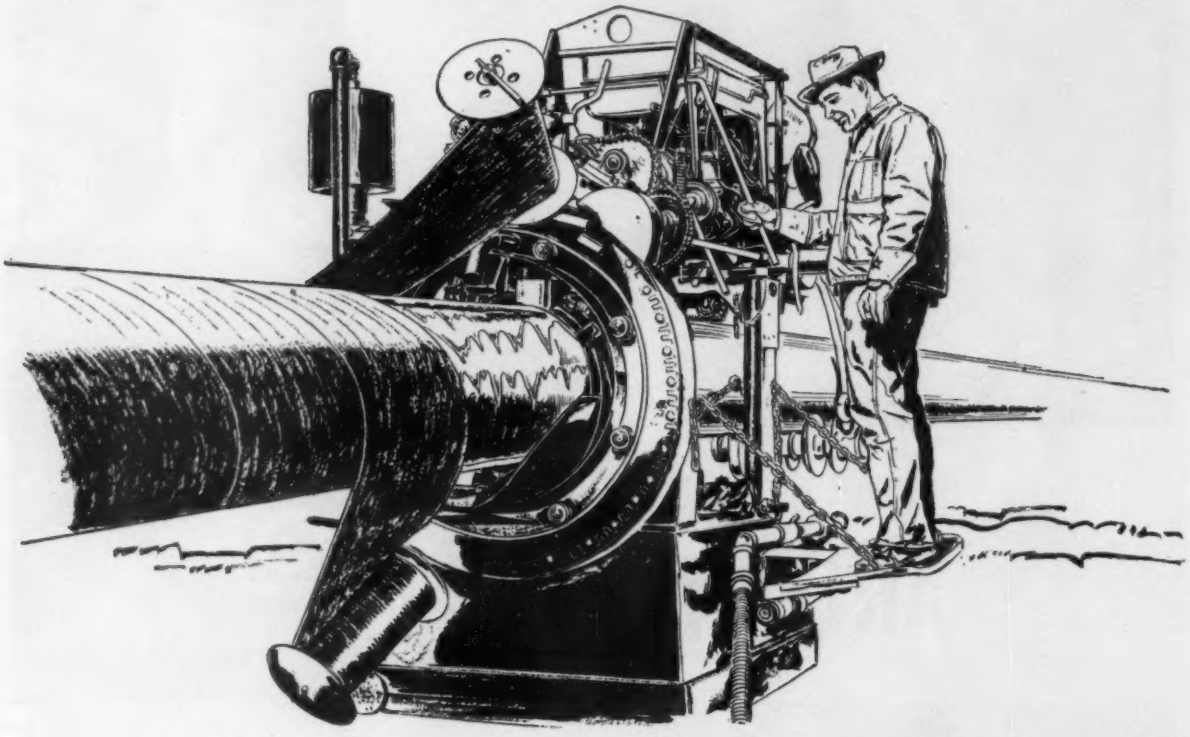
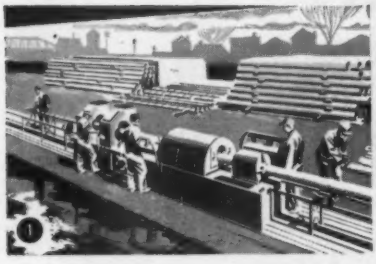
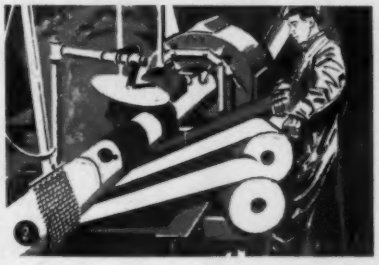
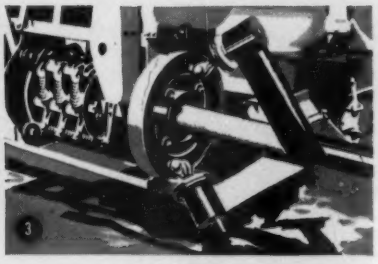
no one coating is best for every job



that's why Dearborn supplies all three







Varying circumstances, job conditions, and even budget limitations prohibit specifying one type of coating for every pipeline. That's why Dearborn offers you all three: asphalt coatings; wax-type coatings; polyethylene plastic tape. These superior coatings, together with the correct primers and wrappers, may be applied at the mill, railhead, by hand or Traveliner. Your local Dearborn representative can help you select the right coating combination for your specific job at lowest possible cost.

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2. Wax-Type Coatings. Write for your copy of Bulletin 3050.
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Dearborn® CHEMICAL COMPANY

MERCHANDISE MART PLAZA, CHICAGO 54, ILLINOIS

WORLD'S MOST COMPLETE LINE OF PROTECTIVE MATERIALS FOR THE CONTROL OF CORROSION

An important step towards good customer relations

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The meter set is your company's representative on the customer's property. Meter sets can be in good taste . . . cleanly piped, well located, fabricated with modern components to reflect credit on the quality of your service. Or they can be ugly eye sores.

Do your meter sets compliment the progressive gas industry? Do they match the appearance of the new homes you are serving? Do they belong in contemporary basements or landscaped yards? Rockwell aluminum meter and regulator sets do! Their eye appealing lines win customer acceptance . . . give the rightful impression of better service and protection from your use of the finest, safest equipment.

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PITTSBURGH 8, PA. Atlanta Boston Charlotte Chicago Dallas Denver Houston Los Angeles Midland, Tex. New Orleans New York N. Kansas City Philadelphia Pittsburgh San Francisco Seattle Shreveport Tulsa In Canada: Rockwell Manufacturing Company of Canada, Ltd., Toronto, Ontario

ROCKWELL GAS METERS AND REGULATORS

THE precision with which measurement and control equipment performs depends to a large extent on the dimensional exactitude to which parts and assemblies are controlled.

The high degree of sensitivity and stability in Rockwell meters and regulators come from the use of advanced design principles, modern materials and many exclusive manufacturing developments.

ACCURACY

... that lasts, for the longest life, at the lowest cost

To maintain accuracy, Rockwell has invested millions in plants and laboratories. Automatic machines, precision tooling and testing take the guesswork out of manufacture. And by grouping the production of related products in separate plants, a closely coordinated measure of quality control is achieved.

The end result is that Rockwell customers get the maximum in accuracy and durability from their measurement and control equipment plus trouble-free performance and low, low maintenance costs. Rockwell Manufacturing Company, Pittsburgh 8, Pa.

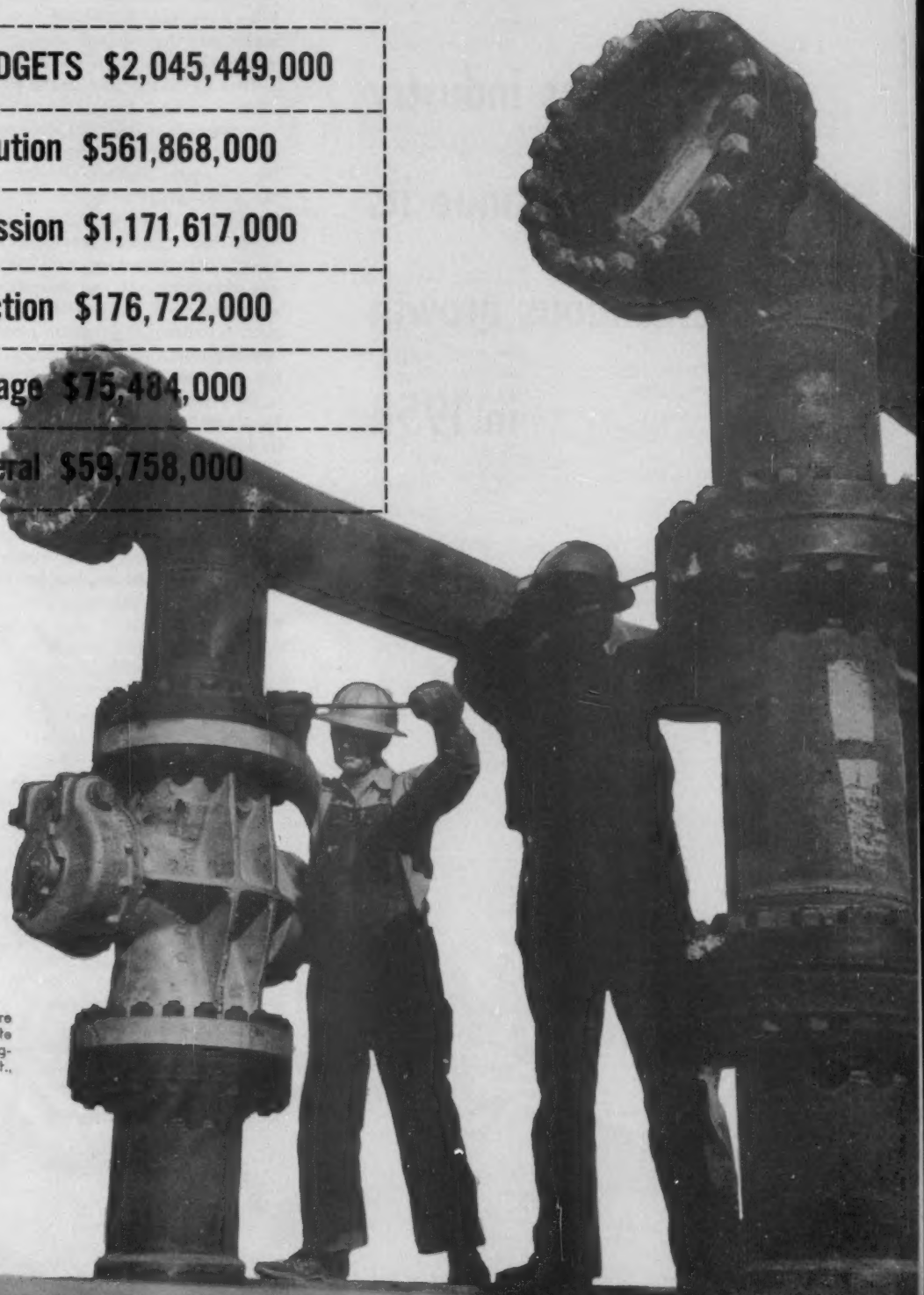
FOUR WAYS IN WHICH ROCKWELL EXCELS

RESEARCH • SAFETY • ACCURACY • SERVICE

ROCKWELL GAS METERS AND REGULATORS

Gas budgets top $2 billion again

TOTAL BUDGETS $2,045,449,000
Distribution $561,868,000
Transmission $1,171,617,000
Production $176,722,000
Storage $75,484,000
General $59,758,000



Reprints of this survey are available. For your copy write to Department C, GAS Magazine, 198 South Alvarado St., Los Angeles 57, Calif.

GAS' ELEVENTH ANNUAL CONSTRUCTION BUDGET SURVEY

Gas industry will continue its tremendous growth in 1958

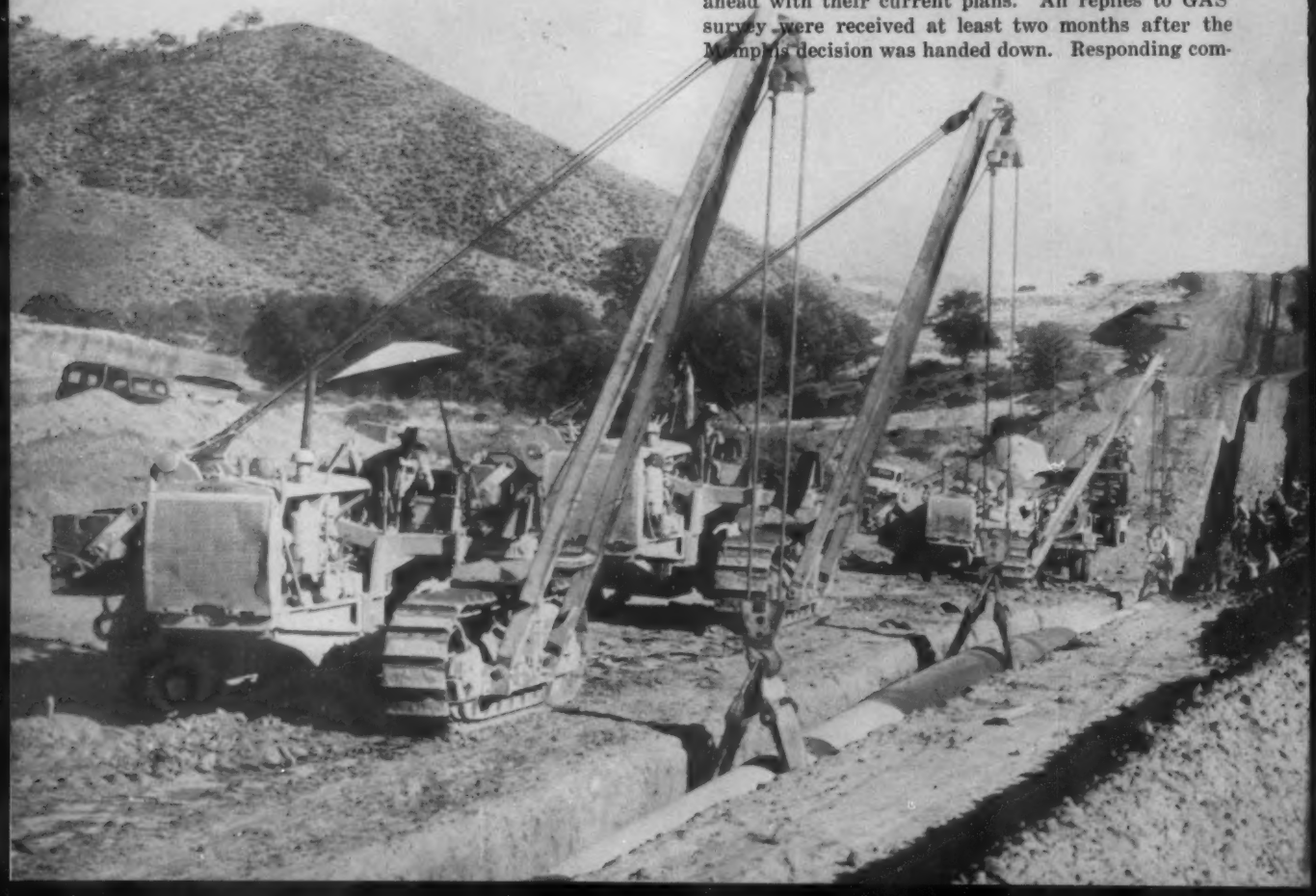
NORTH America's ever-growing gas industry has budgeted $2,045,449,000 for new construction in 1958 — the second straight year budgets have topped the $2 billion mark.

This $2 billion plus figure was reported by 216 companies—distribution, transmission, and integrated—who replied to GAS' 11th annual survey. The responding companies represent nearly 85 per cent of the connected meters and more than 95 per cent of the total pipeline miles in the United States and Canada.

The now-famous Memphis decision is apparently having little effect on the 1958 expansion plans of the gas industry, with one exception. It has caused postponement until 1959 of the Beatrice project, the $182 million expansion program planned jointly by Natural Gas Pipeline Co. of America, Colorado Interstate Gas Co. and Pacific Northwest Pipeline Corp.

This year's budget is down a slight 5.75 per cent from last year ($2,045,449,000 vs. $2,170,671 in 1957). Had not the Beatrice project been delayed a year, 1958 would have been another record breaker.

Other than this one project, distribution, transmission and integrated companies say they are going ahead with their current plans. All replies to GAS' survey were received at least two months after the Memphis decision was handed down. Responding com-



panies had ample time to weigh the decision, and make their plans for 1958 accordingly.

Current economic "recession" trends are not reflected in this year's gas industry planning. Utilities are probably the least vulnerable of all industries to any economic lag. Under no circumstance could gas be classed as anything but an absolute necessity. People must have this fuel in order to live normally. As customers increase, utilities must expand their systems to serve them.

The 1958 budgets solidly back up the earlier prediction of AGA President Robert W. Otto, who said the gas industry would spend $8.7 billion on expansion in the period 1957-1960. This leaves $4.5 billion to be spent in 1959 and 1960.

The tremendous growth of the industry can be seen when this $8.7 billion is compared with the $5.3 billion spent in 1953-1956, and the $4.7 billion in 1949-1952.

What's the big reason for this steady increase in construction spending?

It is the seemingly insatiable demand for natural gas in all parts of North America. Househeating restrictions are still in force in many parts of the country. Nearly all utilities are limiting both commercial and industrial customers in number and in volumes of gas. New houses are still being built at a fast pace—each is a potential new gas customer.

The gas industry added a million new customers in 1957. This year another million will be added to the 31 million already on the lines—and this rate of increase is expected to continue for another nine years.

That's why distribution companies have budgeted $561,868,000 for expansion this year—and it is the reason why they will continue to budget well over a half billion dollars annually for several years.

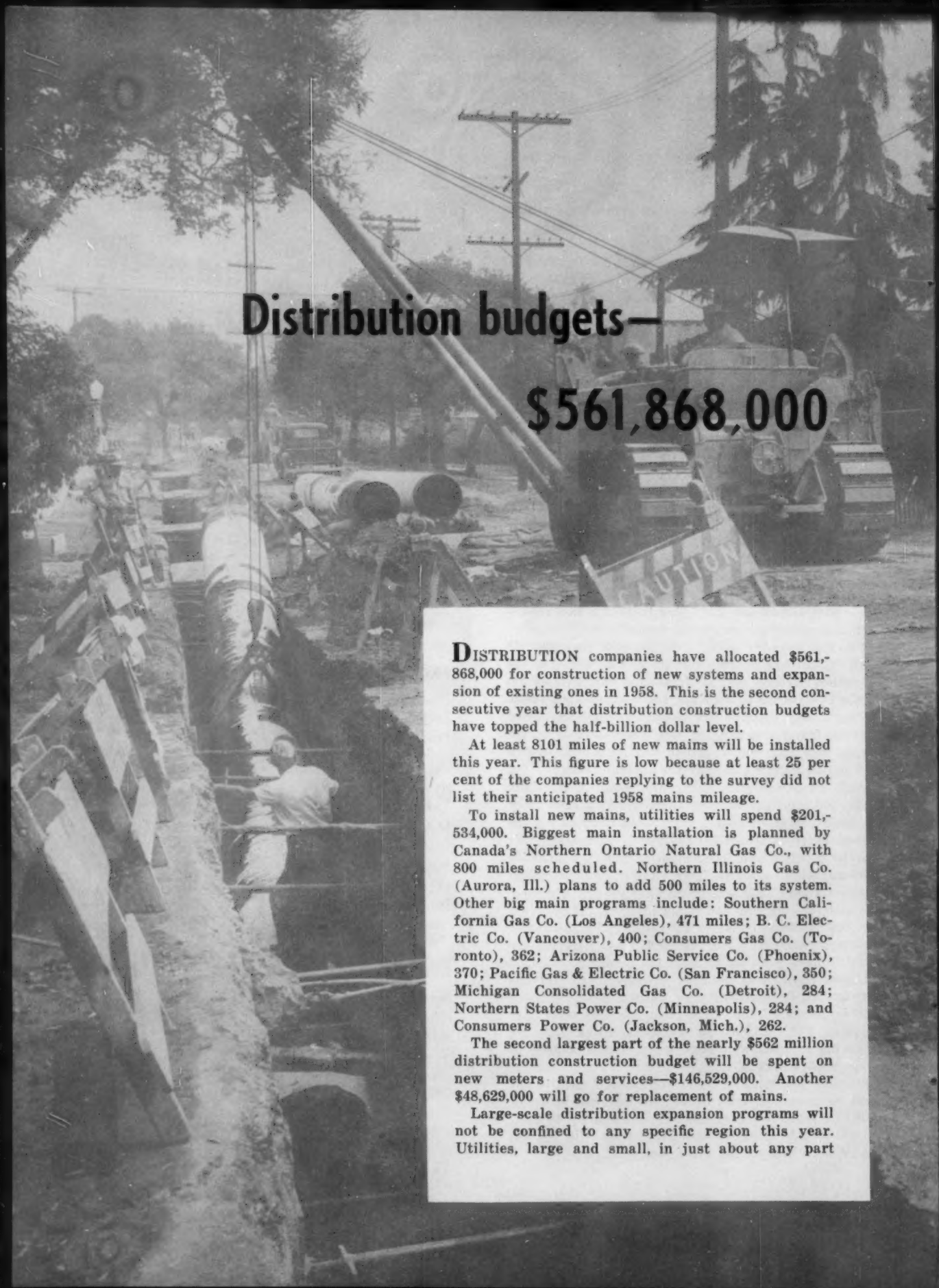
And, as distribution companies boost their daily loads, the pipelines serving them must expand. For the second straight year transmission budgets top the billion dollar total—$1,171,617,000 is earmarked this year by pipeline and integrated companies to provide more gas supplies for their growing utility customers. It appears that 1958 will be another year of big pipeline activity—but the end is not in sight. If distribution companies must serve an additional million new customers each year for the next nine, pipelines are going to keep growing to meet the demands.

It goes right down the line. As pipelines build new lines and expand existing ones, natural gas production must be increased, too. This year, gas companies have budgeted $176,722,000 for plant facilities, drilling, gathering systems and other construction needed to produce more natural gas.

Storage, too, must be increased in 1958, and in the years to come. A total of $75,484,000 will be spent on it this year. General expenditures amount to $59,758,000 as this category, too, keeps pace with the expanded activities of the gas industry.

How the money is budgeted

DISTRIBUTION	**$ 561,868,000**
New mains—cost (Miles of main: 8101)	201,534,000
Replacement of mains	48,629,000
New meters and services	146,529,000
Regulator stations	12,349,000
Cathodic protection	2,007,000
Autos and trucks	10,185,000
Construction equipment	5,737,000
Gas-making facilities	13,611,000
Other	8,053,000
Distribution construction not categorized	113,234,000
TRANSMISSION	**$1,171,617,000**
New lines—cost (miles of line: 10,378)	449,420,000
Replacement of lines	21,992,000
Compressor stations	122,459,000
Autos and trucks	3,365,000
Construction equipment	2,150,000
Miscellaneous	56,335,000
Transmission construction not categorized	515,896,000
PRODUCTION	**$ 176,722,000**
Plant	108,212,000
Drilling	51,443,000
Production construction not categorized	17,067,000
STORAGE	**$ 75,484,000**
Holder	699,000
Underground	49,900,000
Pipe	1,701,000
Miscellaneous	3,046,000
Storage construction not categorized	20,138,000
GENERAL	**$ 59,758,000**
Administrative	16,356,000
Office systems	4,361,000
Administration buildings	16,112,000
Shops and laboratories	6,176,000
Communications	2,170,000
Other	6,113,000
General expenditures not categorized	8,470,000
TOTAL	**$2,045,449,000**



Distribution budgets—

$561,868,000

DISTRIBUTION companies have allocated $561,868,000 for construction of new systems and expansion of existing ones in 1958. This is the second consecutive year that distribution construction budgets have topped the half-billion dollar level.

At least 8101 miles of new mains will be installed this year. This figure is low because at least 25 per cent of the companies replying to the survey did not list their anticipated 1958 mains mileage.

To install new mains, utilities will spend $201,534,000. Biggest main installation is planned by Canada's Northern Ontario Natural Gas Co., with 800 miles scheduled. Northern Illinois Gas Co. (Aurora, Ill.) plans to add 500 miles to its system. Other big main programs include: Southern California Gas Co. (Los Angeles), 471 miles; B. C. Electric Co. (Vancouver), 400; Consumers Gas Co. (Toronto), 362; Arizona Public Service Co. (Phoenix), 370; Pacific Gas & Electric Co. (San Francisco), 350; Michigan Consolidated Gas Co. (Detroit), 284; Northern States Power Co. (Minneapolis), 284; and Consumers Power Co. (Jackson, Mich.), 262.

The second largest part of the nearly $562 million distribution construction budget will be spent on new meters and services—$146,529,000. Another $48,629,000 will go for replacement of mains.

Large-scale distribution expansion programs will not be confined to any specific region this year. Utilities, large and small, in just about any part

of the U. S. or Canada will be on the move.

Future distribution expansion also looks promising. One of the reasons for this prediction is the improvement in the gas appliance picture. The gas refrigerator (now made by Whirlpool Corp.) will be back on the market in a few weeks. And it is likely to be followed by at least two others before year's end.

Gas air conditioning, too, is beginning to show signs of big growth. Several established appliance makers have announced their intention of marketing a gas air conditioner in the immediate future.

Increased competition, and the wider choice of appliances offered to the customer, will help build the highly profitable domestic loads of distribution companies.

Another factor points toward a continuing high level of distribution construction in the next several years. Many companies, mostly in the East, converted their systems from low-Btu manufactured gas to high-Btu natural gas in the early 1950s. Thus, they received a bonus in capacity in the changeover to a gas of higher thermal content. Now, many of them report that they've just about used up all of this "bonus" capacity, and will soon embark on some extensive main-building programs.

Again in 1958 new areas will get their first supplies of natural gas. Distribution construction is continuing at a tremendous pace in Canada as the sprawling Trans-Canada pipeline steadily threads its way across the country. Particular construction hotspot will be in eastern Canada, where Alberta natural gas will be available for the first time this year.

Another big area of distribution construction could be found this year in Florida. The oft-delayed Houston Texas Gas & Oil Corp.-Coastal Transmission Corp. pipeline is now a certainty, and will be under construction in a matter of weeks. This means that several areas in Florida's northern section will receive natural gas before year's end, the other areas will get it in early 1959.

However, none of the required expansion of existing distribution systems and construction of new ones in Florida is reflected in this year's budgets. Several Florida utilities reported that they would not firm up their budgets until actual construction on the pipeline was started. It is known that the 18 existing gas systems in Florida must spent $55.6 million to expand present facilities to handle natural gas. Conversion of these systems will cost another $4 million. Sixteen new systems will be built in cities and towns which do not now have any form of piped gas distribution. This will cost another $8 million. No part of this $67.6 million is included in this GAS survey.

This year distribution companies will spend $13,611,000 on gas making facilities. As a conservative estimate, 80 per cent of this amount will be spent on LPG installations (for peak shaving, standby, or enrichment) by utilities. Most of this will go for storage tanks (either aboveground or underground) and proportioning equipment.

Utilities also reported they will spend $2,007,000 for cathodic protection this year. This, actually, is not the complete figure, since a good many companies did not indicate any specific budget for cathodic protection, but noted that this cost was included in either new mains or replacement of mains.

Transmission budgets— $1,171,617,000

10,378 miles of new pipeline will be built

THERE will be no letup in the tremendous pipeline building pace that the gas industry has been keeping for several years. In 1958, $1,171,617,000 has been budgeted for transmission facilities — the second straight year these budgets have topped the billion mark.

Gas companies reported to GAS that they will build 10,378 miles of transmission line this year, an all-time high in the 11-year history of the survey.

The total number of gas pipeline miles dwarfs the proposed 3000 miles of crude oil pipelines and 1700 miles of products pipelines scheduled for construction this year.

One and possibly more major pipeline projects now set for 1958 may carry over to 1959. Midwestern Gas Transmission Co.'s plans are still awaiting an FPC decision. An interim ruling by Canada's Borden Commission, now seeking to establish an export policy on Canadian gas, is expected soon. A favorable decision from this commission (permitting Midwestern to import Canadian gas purchased from Trans-Canada Pipe Lines Ltd.) could do a lot toward breaking this project loose from its Washington entanglement. Right now, though, it is still a matter of speculation as to whether or not Midwestern will start this year. A recent agreement with Peoples Gas may clear the way for the start of part of the project.

Midwestern is the only major project in the doubtful class. The way has been cleared, finally, for the Houston Texas Gas & Oil Corp.-Coastal Transmission Corp. pipeline to get started. The project (2545 miles of mainline, laterals and gathering lines) will bring natural gas from Texas' Rio Grande valley to Miami, Fla. Spreads will start making pipeline this spring to bring natural gas to the United States' only major population area that does not now have it.

Other than the Midwestern project, Houston-Coastal is the only all-new pipeline set for construction in 1958. Yet, $449,420,000 has been budgeted for new lines, and $122,459,000 for compressor sta-

GAS market study

tions. This shows how existing pipelines are expanding. And, these two figures are even more significant because the Midwestern figure ($111 million) is not included in them. Nor is the $129 million expansion planned by Tennessee Gas Transmission Co. Neither company broke down its budget on the GAS survey. Hence, they are both included in "transmission construction not categorized."

Four $100 million projects are set for this year, plus the possibility of a fifth in Midwestern. Biggest is the combined Houston-Coastal at $158.6 million.

Then comes Tennessee Gas with $129 million. TGT has temporary FPC authorization for construction of 897 miles of pipeline and the addition of 66,990 compressor horsepower.

Trans-Canada Pipe Lines Ltd. will spend $111 million to complete its 2294-mile line this year. And Transcontinental Gas Pipe Line Corp. has budgeted $100 million for pipeline expansion.

Although 1958 will be a big year for pipeline construction, all indications point to even bigger ones ahead.

The Beatrice project, a three-way venture by Natural Gas Pipeline Co. of America, Colorado Interstate Gas Co. and Pacific Northwest Pipeline Corp., is the only major job sidetracked by the Memphis decision. This $182 million project, which will bring more natural gas to Chicago, is now definitely set for 1959. And, NGPL's parent company, Peoples Gas Light & Coke Co., recently announced extensive expansion plans for both Natural Gas Pipeline and another subsidiary, Texas Illinois Natural Gas Pipeline Co. Sixty-three million dollars will be spent in looping the existing NGPL line in 1959-60. Texas Illinois' system will be looped with 860 miles of 30-in. line in 1960-61. Pipe—236,000 tons of it—has already been ordered for the Texas-Illinois job.

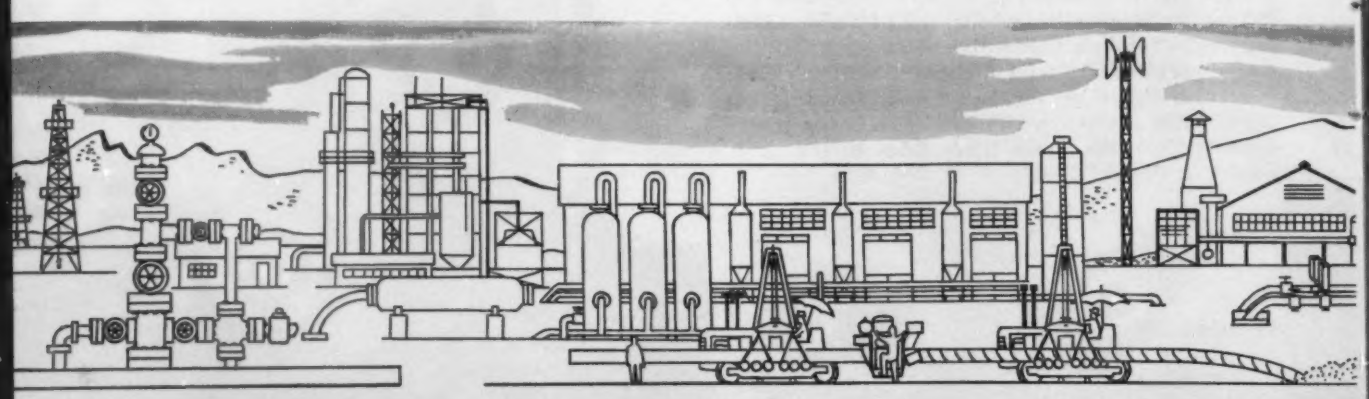
Other big pipeline projects are brewing, too. The two biggest ones center on California. Most ambitious is a proposed $300 million, 1300-mile pipeline from Canada's Alberta province to San Francisco. This one is proposed by newly formed subsidiaries of Pacific Gas & Electric Co. (San Francisco). PG&E hopes to start construction in 1959, deliver gas by 1960.

A $200 million line from fields in West Texas and the San Juan basin to the California-Arizona border is planned by Transwestern Pipeline Co. This company, just formed by Warren Petroleum Co., Monterey Oil Co. and J. R. Butler, a Houston consultant, will deliver gas to operating subsidiaries of Pacific Lighting Corp. (Southern California and Southern Counties Gas companies and Pacific Lighting Gas Supply Co.).

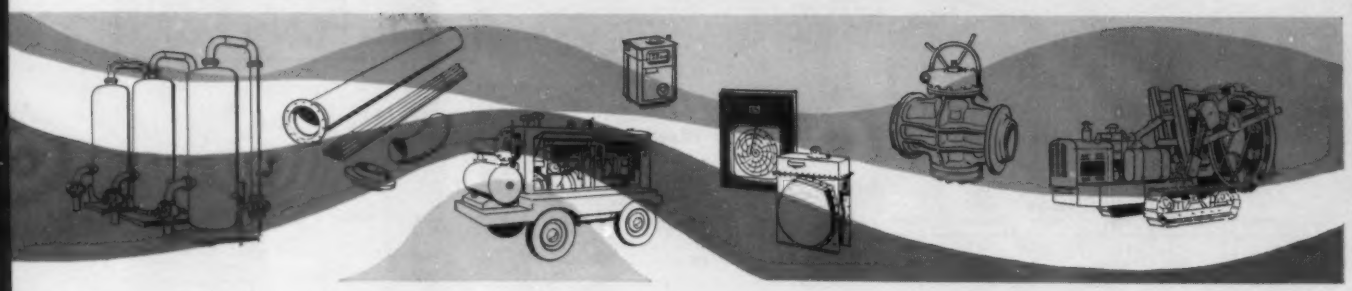
Another big project for the not too distant future is the doubling of Westcoast Transmission Co.'s mainline capacity from the Peace River fields to the U. S. border at Camas, Wash.

1958 budgets of 216 gas companies . . .

COMPANY	TOTAL (In thousands of dollars)	DISTRIBUTION (In thousands of dollars)									PRODUCTION (In thousands of dollars)	
		New Mains Cost	Replacement of Mains	Meters and New Services	Regulator Stations	Cathodic Protection	Autos and Trucks	Const. Equip.	Gas Making Facilities	Other	Plant	Drilling
Alexander City (Ala.) Municipal System	25	←				25				→		
Algonquin Gas Transmission Co., Boston	536				14	30						
American Louisiana P. L. Co., Detroit	1300											
Americus (Ga.) Utility Com.	100	10							90			
Arizona Public Service Co., Phoenix	3710	1521	124	1685	19	25	53	24		249		
Alabama Gas Co., Birmingham	4900	←			3940			→	960			
Arkansas-Missouri Power Co., Blytheville, Ark.	300	100		100	15	10	15	10				
Arkansas-Western Gas Co., Fayetteville, Ark.	1364	108	30	57	8		15	10			177	400
Associated Natural Gas Co., Blytheville, Ark.	321	60		137	3		17					
Atlanta (Ga.) Gas Light Co.	10,594	5345		2625	200		180	135	1500			
Arkansas-Louisiana Gas Co., Shreveport	12,449	936	673	684	101		272	165		25	379	3192
Baltimore (Md.) Gas & Electric Co.	8200	←			7700			→	500			
Battle Creek (Mich.) Gas Co.	425	150		130	25		15		80			
Berkshire Gas Co., Pittsfield, Mass.	450	88	88	130	44		17	8				
Bluefield (W. Va.) Gas Co.	33	22	1	3	2		2	1				
Boston (Mass.) Gas Co.	2895	940	620	710	11		219	126	158	40		
Brazos River Gas Co., Mineral Wells, Texas	575	60	20	7	2		4				160	
Bridgeport (Conn.) Gas Co.	1090	647		376	24		40					
Brooklyn (N. Y.) Borough Gas Co.	374	71	7	217	2		36		9			
Brooklyn (N. Y.) Union Gas Co.	11,388	5350	125	3200	688	35	195	58				
British Columbia Electric Co., Vancouver	10,259	6537	325	2177	354		152	56	313			
Brockton Taunton Gas Co., Brockton, Mass.	1112	393	260	224	47		30	7	8			
Canadian Western Natural Gas Co., Calgary	5865	←				1000				→	700	300
Cabot, G. L., Inc., Charleston, W. Va.	1779	50	25	25			60				270	1227
California-Pacific Utilities, San Francisco	244	209					22		7			
Carnegie Natural Gas Co., Pittsburgh	15,000											
Central Hudson Gas & Electric Corp., Poughkeepsie	1455	445	90	225	60	40			30			
Central Illinois Light Co., Peoria	3209	1081	492	1160	57	5	62		311			
Central Illinois Public Service Co., Springfield	740	135	93	180		1	10	10	16			
Central Indiana Gas Co., Muncie	1998	421	157	476	89	11	24	28	6			
Central Vermont Public Service Corp., Rutland	15	2	1	12								
Charlottesville (Va.) Gas Department	100	60	20	15			5					
Chattanooga (Tenn.) Gas Co.	300	127	33	88	6	4	20	9	4			
Cincinnati Gas & Electric Co.	4084	←			2870			→	682			
Citizens Gas Co., Hannibal, Mo.	60	30	15	15								
Citizens Gas & Coke Utility, Indianapolis	6610	1484		885			118	101	546			
Citizens Gas Fuel Co., Adrian, Mich.	120	35	30	18	2	2	5	3				
Citizens Gas Co., Tuscola, Ill.	56	15	5	15	3	1	5	2				
Coastal Transmission Corp., Houston	59,000											
Colorado Interstate Gas Co., Colorado Springs	4168			100	14	5					2426	484
Colorado Springs (Colo.) Public Utilities	325	←				325				→		
Colorado-Wyoming Gas Co., Denver	264											
Columbia Gas System, New York	89,000	←				22250				→	←	8900 →
Connecticut Gas Co., Hartford	161											
Connecticut Light & Power Co., Hartford	2035	741	148	382	55		20		291			
Consolidated Edison Co. of New York	8900	←				7800				→		
Consolidated Gas Utilities, Oklahoma City	1557	175	250	319	60	160	40					150
Consumers Gas Co., Toronto	16,679	6691		2283	1077		59	87	216	140		
Consumers Power Co., Jackson, Mich.	19,046	3687	1789	7100	248	240				23		1850
Corning (N. Y.) Natural Gas Corp.	150	29	15	40	6		4					
Corpus Christi (Texas) Gas Division	549	273	161	70	18	20	7					
Dayton (Ohio) Power & Light Co.	3112	2291	51	615	55		75	18				
Decatur (Ala.) Gas Department	55	24	4	18	2		4	4				
Delaware Power & Light Co., Wilmington	1703	323	143	468	44		40	21	10			
East Ohio Gas Co., Cleveland	23,161	7460	4175	3100	633		500				284	1148
East Tennessee Natural Gas Co., Knoxville	2403											
Eastern Shore Natural Gas Co., Salisbury, Md.	3625											
El Paso (Texas) Natural Gas Co.	103,486										70,216	11,625
Fitchburg (Mass.) Gas & Electric Light Co.	71	37		30			3					
Gas Service Co., Kansas City, Mo.	5650	2570	150	1700	230	100	200	60				
Great Falls (Mont.) Gas Co.	275	176	25	51			3	11				
Greeley (Colo.) Gas Co.	175	←				175				→		
Green Mountain Power Corp., Burlington, Vt.	52	40					3		9			
Greenwich (Conn.) Gas Co.	200	75	20	72		5	15	5				
Gulf Interstate Gas Co., Houston	56,000											
Hartford (Conn.) Gas Co.	950	433	85	283	25		26	18	7	30		
Haverhill (Mass.) Gas Co.	494	295	60	80	14		18		8			
Hope Gas Co., Clarksburg, W. Va.	2359											
Houston Texas Gas & Oil Corp.	99,666											
Huntsville (Va.) Natural Gas System	180	80		100								
Illinois Power Co., Decatur	5079	834	728	2753			25	40	25			
Indiana Gas & Water Co., Indianapolis	1959	468	195	599	27		47	25	38			

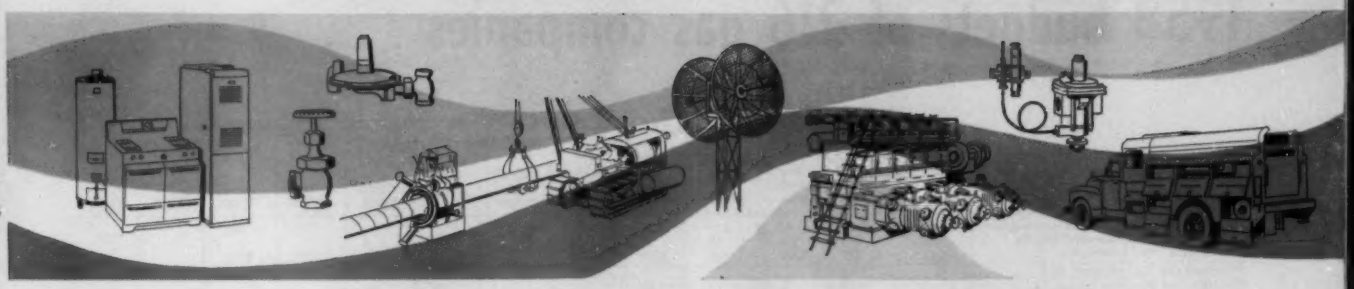


GENERAL (In thousands of dollars)						TRANSMISSION (In thousands of dollars)							STORAGE (In thousands of dollars)			
Adm.	Office Systems	Buildings	Shop and Laboratories	Communications	Other	New Lines Miles	New Lines Cost	Replacement of Lines	Compressor Stations	Autos and Trucks	Construction Equipment	Misc.	Holder	Underground	Pipe	Misc.
105	13			15		14	1000	110		43 50	54	152 250				
	6		15		14	4 18 4	50 253 45	50 25	225	10		20				
287	40 110	500	55	60 362	1447	114	1648	730	1112			282				
	5 3 2	10 8	10 4		62											
←	21		50 3		→	8	165		152	5						
←	17	5 1717	10		→											
256		60		29												
	2	11			130	58	3225	140						500 122		
	4				2	28 6½	15,000 435	65	65							
	4 3	314	9 3	1	28	6	110	175				10		495		
8																
←		32			→	←			500			→				
	65		1112				2219								100	
	25 10					920	54,000		5000							
	23	14		259				141	296	362	28	18				
	8		20	2		5	120	30	32	13	8	31				
←		4430			→	←			35,600			→	←	17,800		→
							145	16					398			
←		1670			→								←	39		→
	45 72		9	5		202	1796	290	18 250	25	20					
	2				1	46	4100 18	25				10				
			15													
	7	420		1 3			201		23							
	110	10	705	52		12 8 124	1800 190 3025	1253	47 975	201		124 1238		837	642	
	1	820					5999		15,656							
	1		8													
	3			5		408	51,000					5000				
	19															
10,668	193					1625	90,467		2359 6720	358	315	925				
	21	70 8	54			8	286	44	28				6	450 187		



1958 budgets of 216 gas companies . . .

COMPANY (In thousands of dollars)	TOTAL	DISTRIBUTION (In thousands of dollars)									PRODUCTION (In thousands of dollars)	
		New Mains Cost	Replacement of Mains	Meters and New Services	Regulator Stations	Cathodic Protection	Autos and Trucks	Const. Equip.	Gas Making Facilities	Other	Plant	Drilling
Intermountain Gas Co., Boise, Idaho	2500	900		1550		25						
Interstate Power Co., Dubuque, Iowa	551	355	13	115			9	9	50			
Iowa Elec. Light & Power Co., Cedar Rapids	2807	1205	256	1169	95	3		33		30		
Iowa-Illinois Gas & Elec. Co., Davenport	2257	876	162	979	134	18		87				
Iowa Power & Light Co., Des Moines	1405	437	155	634	69			15	30			
Iowa Public Service Co., Sioux City	1295	420		510	35	70	30	15	75			
Kansas-Nebraska Nat. Gas Co., Hastings	2955	75	100	30	10	5	45	10			556	1390
Keokuk (Ia.) Gas Service Co.	32	15		10	5		2					
Kingston (Ont.) Public Utilities Commission	677		75	10	32					120		
Knoxville (Tenn.) Utilities Board	314	88		44	5		7		18			
Laclede Gas Co., St. Louis	11,932	2284	1273	4262	219		260	189	60			
Lakeland Natural Gas, Ltd., Kingston, Ont.	3274	2500		472	50		17	50				
Lone Star Gas Co., Dallas	29,302	3662	1864	2616	89	11	342	148		49	2585	10,410
Long Island Lighting Co., Mineola, N. Y.	7400	3000	800	1900	200	20	200		200	80		
Louisiana Power & Light Co., New Orleans	1810	822	150	556		21	60	12				
Louisville (Ky.) Gas & Electric Co.	2993	2200	300		75		10	25				
Lynn (Mass.) Gas Co.	100	38	10	38	2		12					
Madison (Wis.) Gas & Elec. Co.	851	322	270	211	24		9	1	12			
Manchester (N.H.) Gas Co.	206	109		32	9		11	5	25			
Memphis (Tenn.) Light, Gas & Water Div.	3903	1411	613	440	135	20	170	135		225		
Metropolitan Util. Dist., Omaha	2140	685		781	109		132		8			
Michigan Consolidated Gas Co., Detroit	25,659	10,856	2764	8270	902			289				
Michigan Gas Utilities Co., Coldwater	1200	410	125	370	50	16	80	30				
Michigan-Wisconsin P. L. Co., Detroit	23,548											
Mid-South Gas Co., Little Rock, Ark.	432	200	40	90	2	40	90	10				
Milwaukee (Wis.) Gas Light Co.	8964	2183	1204	4196	144	72	224	104	6			
Minneapolis (Minn.) Gas Co.	6755	3251		2304	76		248	77	230			
Midwestern Gas Trans. Co., Houston	111,000											
Mississippi Valley Gas Co., Jackson	1798	433	195	695	15	76	81	28	5			
Missouri Natural Gas Co., Farmington	1310	715	88	135	7	20	10	4				
Missouri Utilities Co., Cape Girardeau	220	112	27	75			5	1				
Mobile (Ala.) Gas Service Corp.	982	406	53	400	48		22					
Montana-Dakota Util. Co., Minneapolis	1683	105	270	450	27	16	13				296	
Mountain Fuel Supply Co., Salt Lake	5500	←				4000				→	← 1500 →	
Nashville (Tenn.) Gas Co.	676	300	10	310	10		23	15				
Nebraska Natural Gas Co., Fremont	47	28	3	11			3	2				
New Bedford (Mass.) Gas & Edison Light Co.	898	370	33	120					135			
New Britain (Conn.) Gas Light Co.	469	323		55	20		6	2				
New England Elec. System Gas Div., Boston	3334	1854	186	794	57		85	48	264			
New Haven (Conn.) Gas Co.	959	430	67	290	26		55	6	46			
New Jersey Natural Gas Co., Asbury Park	3022	950	200	1100	66		130	50	150			
New Orleans (La.) Public Service Inc.	2490	438	522	531	25		69	77				
New Port (R. I.) Gas Light Co.	50	30	1	9	5		3	2				
New Ulm (Minn.) Public Utilities Commission	36	15	20	1								
New York State Elec. & Gas Co., Ithaca	5472	1800	1601	1210								
New York State Natural Gas Corp., Pittsburgh	12,000											3900
Norco (La.) Gas & Fuel Co.	38	10		25								
North Shore Gas Co., Waukegan, Ill.	1542	541	290	497	37	4	50	52	11			
Northern Illinois Gas Co., Aurora	22,300	8435		6400				1125	250			
Northern Indiana Fuel & Light Co., Auburn	209	41	63	82	4		2	5				
Northern Indiana Public Sv. Co., Hammond	5742	2254	163	1525	117	15	200	189	171			
Northern Natural Gas Co., Omaha, Neb.	73,000											
Northern Oklahoma Gas Co., Ponca City	250		40	10							70	80
Northern Ontario Crown Corp., Ottawa	70,000											
Northern States Power Co., Minneapolis	11,736	7911	213	2444	549			31			588	
Northland Utilities, Ltd., Edmonton	2428	500		530	75	2	14	10			35	
Northwest Alabama Gas Dist., Hamilton	40	5		10	20		5					
Northwestern Public Service Co., Huron, S. D.	1114	278	257	409	30	23	18	82	39			
Northwestern Utilities, Ltd., Edmonton	5860	←		2670		→	← 310 →					150
Norwich (Conn.) Dept. Public Utilities	59	28	25	10			4					
Northern Ontario Natural Gas Co., Toronto	22,225	←				14510				→		
Ohio Fuel Gas Co., Columbus	28,942	10,110	921	1514	941		9	100			694	706
Ohio Gas Co., Bryan	541	144	33	91	3		15	7	167			12
Ohio Valley Gas Co., Winchester, Ind.	285	69	43	25	22	5	6	10	28			
Oklahoma Natural Gas Co., Tulsa	9382	830	1529	794		64	279				← 2918 →	
Owatonna (Minn.) Public Utilities	25	←				25				→		
Pacific Northwest Pipeline Corp., Salt Lake City	41,499										24,000	8000
Pacific Gas & Electric Co., San Francisco	28,308	5080	2498	9174	189	81		67	147	617		
Pacific Lighting Gas Supply Co., Los Angeles	9821											
Pennsylvania Gas Co., Warren, Pa.	1712	←				1225				→	← 270 →	
Peoples Gas System, North Miami, Fla.	1048	390	79	382		9	20	12	17			
Peoples Natural Gas Co., Pittsburgh, Pa.	11,053	2167	435	1075	250		263		292		1253	1690

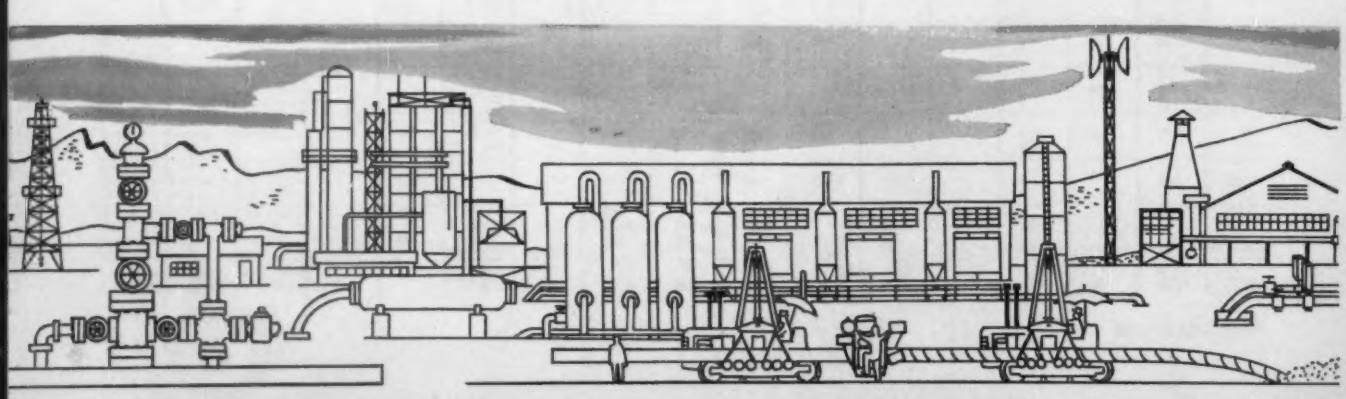


GAS market study

GENERAL (In thousands of dollars)						TRANSMISSION (In thousands of dollars)							STORAGE (In thousands of dollars)			
Adm.	Office Systems	Buildings	Shop and Laboratories	Communications	Other	New Lines Miles	New Lines Cost	Replacement of Lines	Compresser Stations	Autos and Trucks	Construction Equipment	Misc.	Holder	Underground	Pipe	Misc.
			14	25												
			4										52			
30	2	28	5	10 5	70											
	20	15	5	25	5	27	345	150	88	48	14	20				
						6	400		42							
	96		154 694		81									2544		
65	10	10		100												
	161	832	10	45	238	70	2297	1623	86	223	61	1175		795		
	100	800											100			
	175	5	5	4												
								10	15	6				352		
	2															
	15															
	30	655		89												
	60		278		87											
900	130		206	15										1235		
	20	50		9	60											
	8					198	9628		13,752	119		38				
1	6		2	1				10								
	65	678	85	3												
	38	63	8	85	375											
						2067	←		111,000			→				
	30	60	10	1			102	66						1		
	3		3			9	325									
	48				3											
	25		10	5				310	88	20	22			22		
	8															
	2		20		13											
	3								60							
	32		7	6												
	6	33														
	12				15	8	350									
	49	740	34	5												
	6					6	281	574								
						←			5700			→		2400		
	15	15	21	3	6											
2300	90	1787	25		30								←		1858	→
8	4															
	40	56	6	4										1000		
						380	←		73,300			→				
								40		5	5					
							←		70,300			→				
	10		2			96	1250									
	4		1	3												
	20	250		10			5450									
	2	1	1													
						180	←		7715			→				
	175	867	281	107		91	5567	1615	185	3	75	142		1627	859	2464
			11	1			54	3								
								75								
512	242				267	87	1063	846	8			351				579
186				72	902	100	7418		428			493				
			35		120		6711	886	1732		695			276		
					210	88	4935	106	301			169		4100		
←		125			→	←			42			→	←		50	→
	6			7	10	5	136									
	90	85		58	122		250	2838	65					230	90	

1958 budgets of 216 gas companies . . .

COMPANY	TOTAL (In thousands of dollars)	DISTRIBUTION (In thousands of dollars)									PRODUCTION (In thousands of dollars)	
		New Mains Cost	Replacement of Mains	Meters and New Services	Regulator Stations	Cathodic Protection	Autos and Trucks	Const. Equip.	Gas Making Plants	Other	Plant	Drilling
Peterborough (Ont.) Utilities Commission	1080	50		50						100		
Petersburg (Va.) & Hopewell Gas Co.	309	171	12	70	50			4				
Philadelphia (Pa.) Electric Co.	12,292	5927	440	1325	106	10			1078	1178		
Piedmont Gas Co., Hickory, N. C.	2660											
Pineville Gas Co., Monroe, La.	75	30	10	15	2	3	3	12				
Pioneer Natural Gas Co., Amarillo, Texas	3855	784	149	868	74	13	172	35		98		
Plateau Natural Gas Co., Colorado Springs, Colo.	308	95		7		10	9			37	40	
Portland (Ore.) Gas & Coke Co.	5571	2003	1756	1337	51	67	127	50	50			
Portsmouth (Va.) Gas Co.	373	190		142			13	19	1			
Providence (R. I.) Gas Co.	1400	1000		300	50		50					
Public Service Co. of Colorado, Denver	7968	2390	810	2516	34	65	36				60	
Public Service Electric & Gas Co., Newark, N. J.	27,692	9101	877	6920	1269		533	158	3172	4313		
Quebec Natural Gas Co., Montreal	12,000	←				12,000				→		
Quebec Power Co., Montreal	5	←				5				→		
Richmond (Ind.) Gas Corp.	125	←				125				→		
Richmond (Va.) Department Public Utilities	785	440		325								
Rochester (N. Y.) Gas & Electric Corp.	4904	1835	585	2200	100			50	134			
Rockland Light & Power Co., Nyack, N. Y.	3032	2163	40	548	139		34	95				
Roanoke (Va.) Gas Co.	1016	80		90	12		12					
Saskatchewan Power Corp., Regina	14,925	3085		90	109						← 1800 →	
San Diego (Calif.) Gas & Electric Co.	6328	1636	701	1725	6		104	68	4			
Shelby (N. C.) Gas Department	110	4		4			2					
Sierra Pacific Power Co., Reno, Nev.	350	76	80	100			7	7	80			
South Carolina Electric & Gas Co., Columbia	3030	894	30	389			30	16	80			
South Jersey Gas Co., Atlantic City	1773	664	175	444			83	42				
Southeastern Michigan Gas Co., Port Huron	350	80	40	225			19	5				
Southern California Gas Co., Los Angeles	40,263	7012	3144	11,581	221	161	1683	433				
Southern Counties Gas Co., Los Angeles	22,745	5200	3000	6280	20		85	45		570		
Southern Indiana Gas & Electric Co., Evansville	1380	237	105	542	47	12	29	21				
Southern Natural Gas Co., Birmingham	25,000											
Springfield (Mass.) Gas Light Co.	1125	500	25	200			25	10				
Southwestern Public Service Co., Amarillo, Texas	218		135	69			2					
Sugar Bowl Utility, Inc., Thibodeaux, La.	80		68	12								
Springfield (Mo.) City Utilities	682	338	47	223	6		7	24				
Superior (Wis.) Water, Light & Power Co.	72	25	12	28				5				
Sylacauga (Ala.) Gas Board	170			15			5		150			
Tennessee Gas Transmission Co., Houston, Texas	129,000											
Texas Eastern Transmission Corp., Shreveport, La.	46,110											
Texas Eastern-Penn Jersey Trans. Corp., Shreveport	12,297											
Texas Southeastern Gas Co., Bellville	174	15	30	2	2		5					
Texas-Illinois Natural Gas P. L. Co., Chicago	12,572											
Trans-Canada Pipe Lines, Ltd., Toronto	111,587											
Transcontinental Gas P. L. Corp., Houston, Texas	127,175											
Union Gas Co. of Canada, Chatham, Ont.	30,000	←				30,000				→		
Union Gas System, Inc., Independence, Kan.	915	187	279	55							10	130
Union Light, Heat & Power Co., Cincinnati	624	←				624				→		
Union Producing Co., Shreveport	3,512											3,512
United Gas Pipe Line Co., Shreveport	37,343											
UGI-Harrisburg Gas Div., Harrisburg	1945	1260	162	323	42	4	44	32	20	34		
UGI-Lancaster County Gas Div., Lancaster	692	301	169	122	5		27	3	15	35		
UGI-Lehigh Valley Gas Div., Allentown	2630	1716	287	328			75	45	77	42		
UGI-Reading Gas Div., Reading	673	204	125	218			35	20	19	18		
United Natural Gas Co., Oil City, Pa.	1727	←				655				→	←	251 →
Virginia Electric & Power Co., Richmond	1431	703	13	680			24		1			
Washington (D. C.) Gas Light Co.	11,700	4265	425	4308	164	225	326	152				
West Ohio Gas Co., Lima	950	391		240	4		20	15				
West Tennessee Gas Co., Jackson	110	47	51	3	5				1			
Western Kentucky Gas Co., Owensboro	1575	479	100	452	14	5	24	9				25
Westfield Gas & Elec. Light Dept.	60	50		10								
Wilcox Trend Gathering System, Shreveport	777											
Wisconsin Natural Gas Co., Racine	3004	1849	929	140			50					
Wisconsin Power & Light Co., Madison	1800	1380	200	30	70	20	75	25				
Wisconsin Southern Gas Co., Lake Geneva	387	75	115	102	1		18	6	80			
Wisconsin Public Service Corp., Milwaukee	2090	785	350	630	70	55	60		20			
Worcester (Mass.) Gas Light Co.	2129	1094	95	470	38			5	399			
Wyoming Gas Co., Basin	37	8	12	9	2	1	5					
Company A	1327	555	144	541	16	7	35	15				
Company B	8404	1110	1615	777			237				885	2313
Company C	450	50	30	40	15		70	10			35	15
Company D	150	100		25	16		2	5				
Company E	1000	←				1000				→		
Company F	9970			15	179						3432	142



GENERAL (In thousands of dollars)						TRANSMISSION (In thousands of dollars)							STORAGE (In thousands of dollars)			
Adm.	Office Systems	Buildings	Shop and Laboratories	Communications	Other	New Lines Miles	New Lines Cost	Replacement of Lines	Compressor Stations	Autos and Trucks	Construction Equipment	Misc.	Holder	Underground	Pipe	Misc.
100 2					180	26	600									
←		9380			→			210	1000			55				
						78	←		2000			→				
	51	1	130	19	26		329	704	337	82	43					
3				2		7	54	5	6			38				
	30 5	50	2	1	50											
	29 111	825	28 285	2	865 128	24	925		112	20		56				
			10		3											
500	8		14	50		18	860									
	21	17	4	9	22	271 20	8100 2000		800			8		600		3
						5	100									
					5	71	1887					48				
22	9	157					130					47				
	10 421	2293	208			21	7264	1892	2526				95	1289		
	110 5	2773 20			465	10	3000 272	500	500 10			197		80		
							←		25,000			→				
	25	28	15				10									
	3		33 1	1									1			
						897	←		129,000			→				
342 46	368 91		1004 291	327 91		72	9336 106		33,476 11,490	733 91	340 91	8		176		
						5	55	60		2		3				
	105			72		491	8111 89,974		4400 19,512	644	950	61 330				
						800	51,946	4749				44,293		26,187		
	13	18		7			10	97		45	29			35		
							←		37,343			→				
	8		10										6			
	6 54	9											6			
	12	22														
←		110			→		←		311			→	←		400	→
	10															
	77	570	14	24									35	1005	10	
10	15 1	50	2			8½	140	50	15							
	17	6	3	1		8	105							335		
	6			3		55	869		58	25	14	2				
	1		14	3	18											
5	5	5	5					100								
	10		6		12											
	2	8	4													
	12	19		71				459	81	42	43	5		735		
	15							110						60		
	18		52	73			1505	1010	1009	190	40	60		2245		

Production budgets—$176,722,000

THE classical way for gas companies to increase their natural gas reserves was to go out and sign contracts with producers. In recent years, however, more and more gas companies have moved into drilling and producing operations.

This trend is being carried over into 1958. In fact, it is becoming more pronounced because gas companies report that they have budgeted $176,722,000 for natural gas production activities and facilities this year.

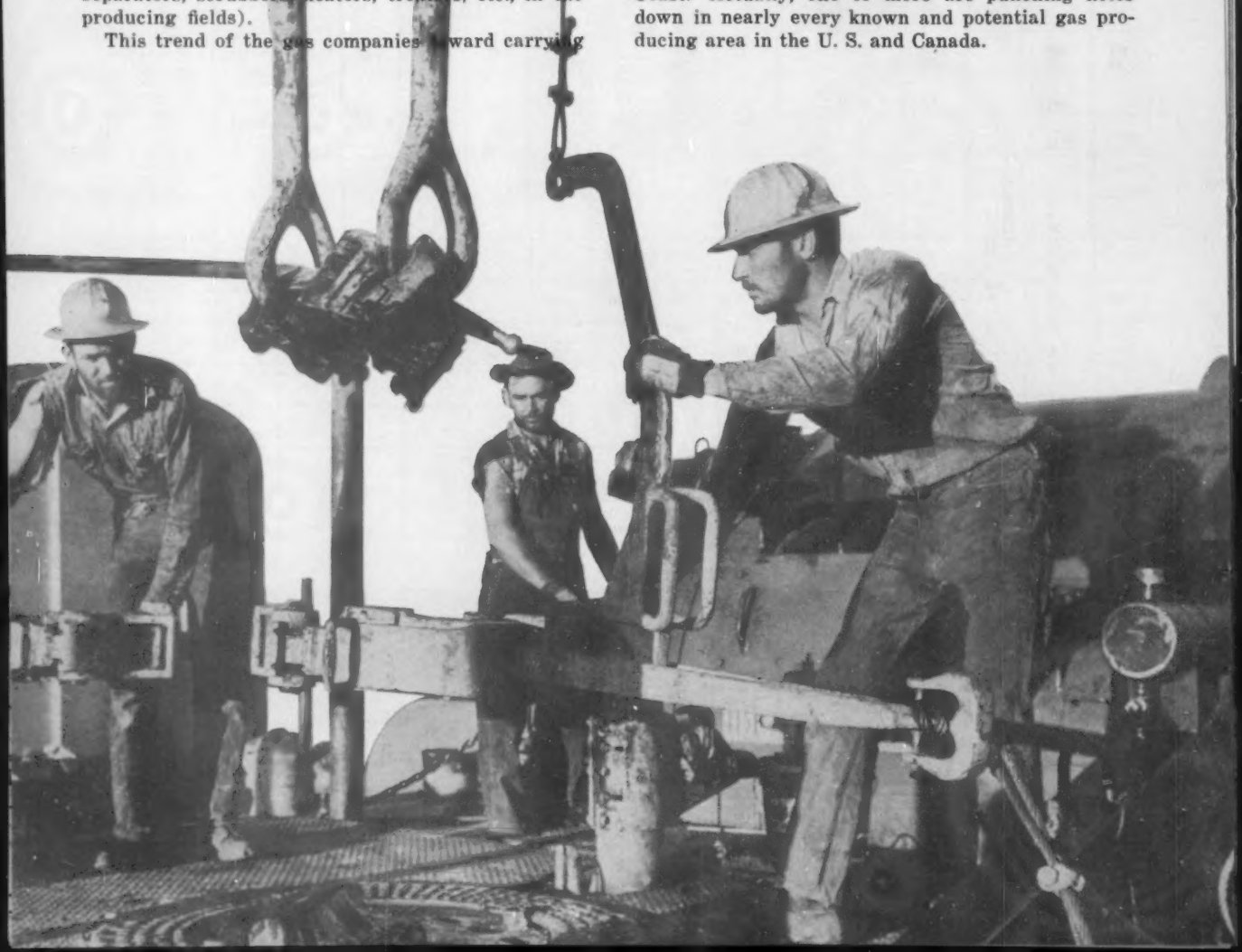
These $176 millions represent what the gas industry itself is spending to improve the gas supply picture. It does not reflect in any way the production programs of major and independent oil companies or independent gas producers.

The budgets break down into $108-odd million for producing plants (dehydration facilities, natural gasoline extration plants, desulfurization plants, and the like); $51.4 million for gas-company owned drilling and exploration; and $17 million for unsegregated production construction (gathering lines, separators, scrubbers, heaters, treaters, etc., in the producing fields).

This trend of the gas companies toward carrying out more of their own producing operations is very important. The reason for the trend is obvious. Exploration and drilling by producers not associated with gas companies is down—and wildcat drilling is way down. This stems from the very gloomy prospects of ever getting the Harris-O'Hara bill through the Congress and into law or for passing any other bill to free independent gas producers from the clutches of Federal regulation.

The answer for the gas industry, then, is to drill and produce more of its own natural gas requirements. This they will do in 1958 and subsequent years.

For exploration and drilling, the most exciting area seems to be in the coastal and offshore regions of the Gulf Coast—particularly southern Louisiana. Several gas companies or their wholly owned subsidiaries are active in that area. And new gathering and processing facilities are going in along with field compressors. However, gas companies are not by any means restricting themselves to the Gulf Coast. Actually, one or more are punching holes down in nearly every known and potential gas producing area in the U. S. and Canada.



Storage budgets—$75,484,000

STORAGE continues to gain importance in gas industry operations. This year, $75,484,000 has been budgeted for construction of storage facilities of all types.

Roughly two-thirds of this total—$49.9 million—will be spent for underground storage as those companies with underground facilities continue to expand them, and other companies seek to develop fields of this type.

Holders, once the mainstay of any distribution company, are all but through. Only $699,000 will be spent in this category in 1958. Several companies indicated they had made budgetary provisions for dismantling old holders.

Today, the gas industry has some $500 million in capital investments in underground storage facilities. It is estimated that the present underground storage fields now in use can store enough natural gas to meet 20 per cent of the industry's total requirements for its biggest demand day of the year.

Development of terminal underground fields figures prominently in the 1958 budgets of many companies — both pipeline and distribution. These storage fields permit companies to build up their loads during the off-peak summer months, then draw out the gas as it is needed during the heating season.

Biggest single expenditure ($26 million) will be made by Transcontinental Gas Pipe Line Corp. for development, in conjunction with other companies, of the Leidy and Tamarack storage fields in Pennsylvania. Transco wants storage facilities to help meet its heavy peak-day demands from utility customers in the New York area.

Laclede Gas Co. (St. Louis) used its Florissant, Mo., underground field extensively this past winter; now, it will spend $2.5 million to drill seven additional deep wells and add compressor horsepower.

A pipeline company has $2 million earmarked for completion of an underground field in Kansas. Pacific Lighting Gas Supply Co. (Los Angeles) will spend $4 million for further development of facilities at its Montebello (Calif.) field, and for building new facilities and testing another field.

Ohio Fuel Gas Co. (Columbus) will drill 66 wells in its underground storage network, and do other work that will total over $4 million.

Detroit's Michigan Consolidated Gas Co. has more than $1 million set aside for underground development, including the acquisition of a gas field to be held for future underground development.

Also in the storage category, but of a slightly different nature, is the $1 million which Northern Indiana Public Service Co. (Hammond) will spend for development of an underground propane cavern.

General budgets—

$59,758,000

GENERAL expenditures by gas companies this year will total $59,758,000. Most of this amount will be spent in moves designed to increase the efficiency of non-operating departments and to expand overcrowded offices, shops, and laboratories.

More than $16 million will be spent in the "administrative" category. This includes funds allocated for setting up supervision and stockpiling yards in construction areas.

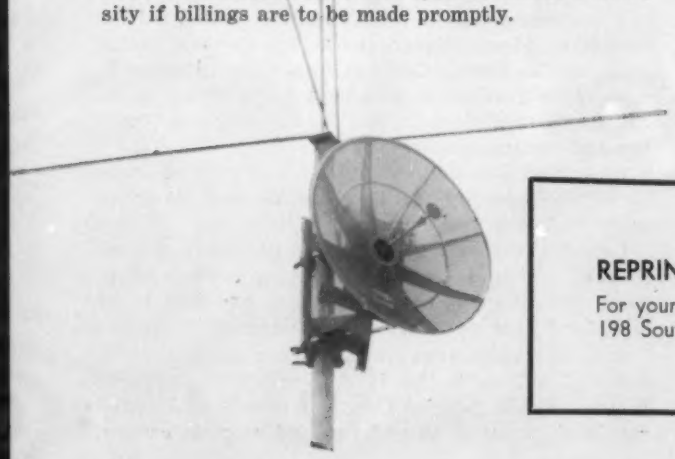
Another $16 million has been budgeted for new office and administration buildings. Southern Counties Gas Co. has more than $2 million set aside for a new 13-floor office building in downtown Los Angeles.

More than $4 million will be put into office systems as gas companies constantly strive to make their billing and accounting departments more efficient. Much of this money will be used to set up automatic data processing systems for billing. The constant addition of new customers makes such systems almost a necessity if billings are to be made promptly.

The trend toward more de-centralization of distribution companies is apparent again this year. A $6 million allocation for shops, laboratories and service centers shows that in 1958 utilities will continue the recent practice of establishing complete district service facilities, and get away from the older method of handling most of the service calls, etc., from one main headquarters.

Some other interesting expenditures were noted by companies replying to the GAS survey. Public Service Electric and Gas Co. (Newark) plans to spend $285,000 for a new load dispatching center. Brooklyn Union Gas Co. has $42,000 set aside for installation of facilities for a computer center.

Brockton Taunton Gas Co. (Brockton, Mass.) notes that it will buy $130,000 worth of water heaters and conversion burners, which it in turn will rent to customers. Michigan Gas Utilities Co. (Coldwater, Mich.) will spend $60,000 for gas appliances to further its appliance rental program. ■



REPRINTS OF THIS SURVEY ARE AVAILABLE

For your copy, write to Department C, GAS Magazine, 198 South Alvarado St., Los Angeles 57, Calif.

Public Service's new regulator station in southwest Denver. Automatically controlled station supplies gas to a portion of Denver gas system and western suburbs. Regulating equipment is housed in sub-grade room.

By EVERETT ROARK, Pressure Regulation Engineer
Public Service Co. of Colorado, Denver

Flexibility, automation in regulator station design

FOLLOWING World War II, a tremendous pent-up demand hit Denver to convert from other fuels to natural gas. Thousands of new people flocked to the mile-high city and huge subdivisions were built on its periphery. Hundreds of new businesses and industries moved to or built branches in the booming city and in adjoining communities. Denver's skyline literally changed overnight, as large new office buildings were built and are continuing to be built in the downtown area.

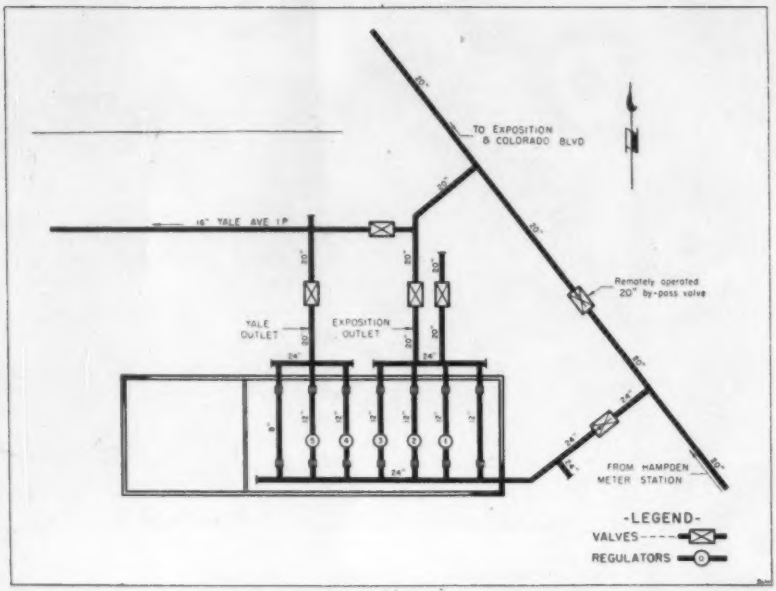
This has been the picture facing the Public Service Co. of Colorado's gas operating department since 1946. The department has been faced with the task of rebuilding a large portion of the old distribution system, a hold-over of the manufactured gas days, as well as installing hundreds of miles of main to serve new residential subdivisions. The initial post-war demands were served by a single natural gas transmission pipeline built in 1928 from western Texas to Denver. Today, there are four pipelines serving Denver from three of the major natural gas fields in the country located in western Texas, Oklahoma, Kansas and the Four Corners area and one line from the recently developed Little Beaver and Adena fields in northeastern Colorado.

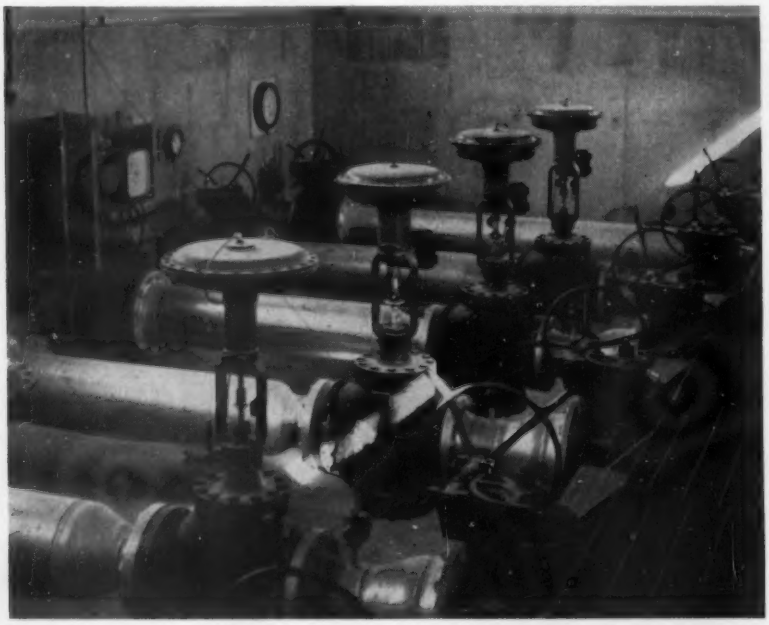
Public Service Co.'s transmission pipeline supplier of natural gas to the metropolitan Denver area is the Colorado Interstate Gas Co. In 1928, CIG built Denver's town border station on the extreme southern edge of the city. Post-war residential growth in the Denver area progressed at such a rapid rate that before long it had encircled the original town border station. CIG found its 20-in. mainline feed to the town border station winding down residential streets and alleys with clearances from structures and improvements no longer conforming to prudent operations nor national codes for high pressure pipeline operations in urbanized territory.

As a result, Public Service Co. and Colorado Interstate negotiated to move the town border station from its position in the residential area to a new location, known as the Hampden meter station, some five miles down the pipeline, away from the concentration of residential construction. Public Service Co. agreed to purchase the 20-in. pipeline extending from the old meter station to the new location and to convert it to an intermediate pressure main, feeding gas into the Denver IP system.

This five-mile section of pipe also serves the Yale and Quincy laterals which supply gas to the Arapahoe steam-electric generating station and the city's southern and western suburbs.

Company engineers recognized that the converted 20-in. main could not serve expected loads at the negotiated contract pressures because of the additional pressure drop involved in five additional miles of intermediate main. Negotiated pressures starting at 250 psig in 1957 will be adjusted downward 50 psig per year to a final operating pressure of 150 psig in January 1959. This two-year adjustment period was negotiated to allow time for installing the necessary reinforcing mains to carry the load at the reduced pressures.





At left is a schematic piping diagram of the Yale Ave. control station. Below is an interior view of piping and valves at the station. Three electrically controlled valves in background supply gas through Exposition line; two valves in foreground control Yale laterals feeding suburbs.

The nominal operating pressure in the Denver IP system is 100 psig. Because of this pressure, and loads requiring variable regulation in the Yale and Quincy laterals, it was necessary to install a pressure control station downstream of the Hampden meter station. The new station, called the "Yale Junction Control Station," was located on the converted 20-in. main at a point south of the Yale St. lateral.

Company engineers who designed the Yale junction station were confronted with some exacting and unusual conditions relating to pressure control practice. First of all, the station had to be designed to simultaneously serve two mains at different pressures. This called for two separate piping systems, one feeding the 20-in. mainline to Exposition and Colorado Blvd., and the other the Yale Ave. main.

The most exacting demand was, that, under ultimate load conditions, the Exposition outlet was expected to pass 10 MMcf/hr (at 14.4 psi pressure base) with a calculated 6-psig pressure drop across the regulating elements of the station. This pressure differential across the regulating element is approaching the realm of unsatisfactory operation.

Since any conventional pressure-loaded regulator requires a loading pressure somewhat higher than its downstream pressure, this type of regulating device was immediately ruled out. The possibility of using a conventional 20-in. pipeline plug valve controlled by a valve positioner and a pressure controller instrument was considered and abandoned.

The feasibility of using a diaphragm-controlled balanced valve using a valve positioner and pressure pilot seemed the most promising solution. It was finally decided to use three 8-in. diaphragm-operated, balanced throttle-plug valves as the major pressure controlling element on the Exposition outlet. Along with this scheme, was proposed a remotely operated 20-in. plug valve in a by-pass around the station feeding directly into the Exposition outlet line. This system is considered unique in its mode of operation.

A commercially built pressure controller, having a variable output control pressure range from 15 psig to 3 psig, was connected to each of the 8-in. diaphragm valves through a separate receiver-controller mounted on each regulator. The receiver-controllers obey the pressure output signal from the pressure controller and, through their separate outputs, stroke the attached 8-in. diaphragm valve.

In order to reduce the tendency to hunt, the diaphragm valves are scheduled to come into service in sequence so that as one is fully open due to the load, the next one will begin to open and finally the third. This is accomplished by adjusting the receiver-controllers so that the first one fully strokes its diaphragm valve upon receipt of a pressure signal from 15 psig

to 11 psig. At this point the second receiver-controller starts to open its diaphragm valve and is fully open when the signal has reached 7 psig. The third diaphragm is opened on the remaining 7 to 3 psig signal to its receiver-controller. Actual operating experience may prove that some overlapping sequence of valve travel may produce smoother operation. This sequence, of course, reverses itself as the flow diminishes.

These diaphragm valves open on a diminishing pressure signal from the receiver-controllers as well as the pressure controller, allowing maximum valve opening when inlet pressures are low.

The 20-in. by-pass plug valve comes into play in order to reach capacity when inlet pressures are low and the maximum outlet pressure is required. This by-pass valve is triggered to open slowly to an experimentally predetermined position when the third 8-in. diaphragm valve approaches its wide open position. This allows the bulk of the gas load to flow through the by-pass line.

When the by-pass valve opens the diaphragm valves are relieved of a portion of their load thus allowing valves three and two to close in sequence. The number one diaphragm valve is then used to trim the downstream pressure. As the load continues to diminish the number one diaphragm valve begins to close and as it approaches a locked-up condition it triggers the 20-in. by-pass plug valve to close slowly. This allows the diminishing load to be handled by the normal cycling pattern of the three 8-in. diaphragm valves, completing, let us say, a peak loading and unloading cycle.

The Yale Ave. lateral will be served by two similar 8-in. diaphragm valves with a conventional hand-operated by-pass.

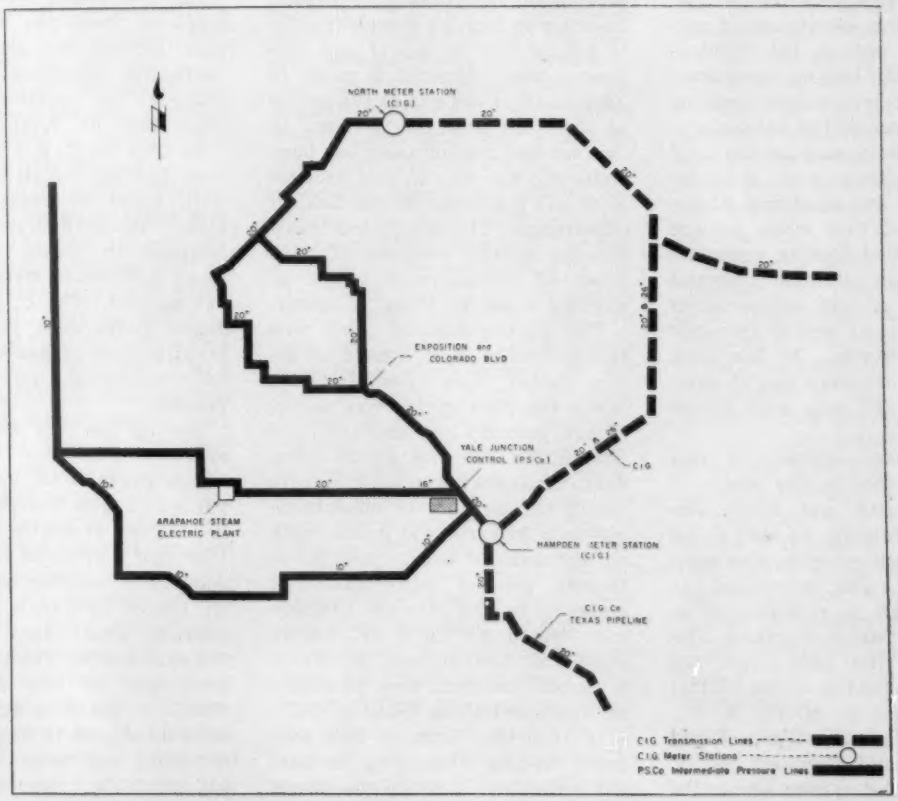
Pressure information from the sensitive points in both systems are telemetered to the operator's control panel at the Yale junction station which furnishes the operator with all the necessary pressure data to intelligently operate the system.

Although this station is located far outside the residential area, there is no assurance that future housing developments will not again surround the new station. For this reason the noise problem was considered in constructing the Yale station. The station piping is installed in a sub-grade room to minimize regulator noises. The operator's quarters and control panel are built above ground but isolated as much as practicable from the operating part of the building for operator comfort.

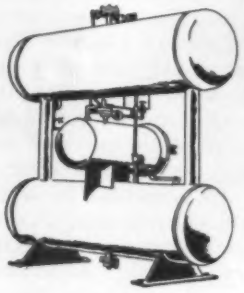
Under present operating conditions it's possible to serve the western suburbs through the Yale Ave. lateral, thus re-enforcing the Quincy lateral. However, because pressures can be varied with load, lower average pressures can be maintained.

It is planned in the future to provide remote controlled regulation on the Quincy line, thus providing even greater system flexibility than now exists.

When final plans are put into operation it will be possible to provide adequate service to all areas, yet maintain minimum pressures in the intermediate pressure system. ■



Map shows portion of Public Service Co. of Colorado's intermediate pressure system in Denver.



Odorization of an integrated gas system

By A. F. KYHOS, Gas Engineer
Montana-Dakota Utilities Co., Minneapolis

THIS article is presented with a view to acquaint readers with the experience of a gas company in the odorization of natural gas as well as the development of odor-testing practices. We sincerely believe our company to be a pioneer in the natural gas odorization field, and particularly in long distance high pressure transmission line odorizing. Please bear in mind that while we are primarily a distributing organization, we also produce material percentages of our requirements of natural gas as well as transmit at high pressures. It has been necessary to transmit gas at pressures up to 800 psig with design to 950 psig.

The company operates a natural gas system in the states of Montana, North and South Dakota and Wyoming, as well as an electric system covering the same general area. The integrated gas system, which is referred to as the Baker-Bowdoin-Worland system, covers the area from the Bowdoin gas field in north central Montana; east to Minot, N. D.; south to Worland, Wyo., Rapid City, S. D., and Bismarck, N. D. A nonintegrated system serves the Buffalo and Sheridan, Wyo., area.

There is a substantial number of farm tap customers taking gas directly off the transmission lines. In order to furnish complete safety advantages for all of our customers every attempt is made to odorize all of the gas at the points of injection into the system. In this we feel the company has been eminently successful, and because of it has pioneered in the field of odorization. The integrated transmission system consists of 1180 miles of transmission mains of varying sizes to 12-in. diameter.

The development of most new things results from a need or desire rather than from accident. While the phonograph was an accident, natural gas odorants and odorization are the result of a definite need as well as a sincere desire on the part of conscientious men to serve the public with an optimum of safety and satisfactory product performance. I sincerely believe that two of these men would be Cecil W. Smith, president, and Hubert M. Frederickson, assistant vice president of Montana-Dakota Utilities Co.

In 1880 the Germans first proposed adding something to fuel gas which would contain a strong odor and give the otherwise unseen and unfelt gas an agent of warning of its presence. The Germans later found (1905) that condensates from the newly developed Pintsch gas process were a successful odorizing agent. This material was marketed under the trade name of "Karbialin."

In 1918 the U. S. Chemical Warfare Service odorized water gas with butyl mercaptan to detect leaks. In 1919 Kansas City attempted to locate underground leaks with amyl mercaptan without success. The U. S. Bureau of Mines in the same year began an investigation of gas odorants and later published a bulletin of their findings.

During the late 1920's a widespread replacement of manufactured gases with sweet natural gas was begun. Sweet natural gas is odorless, or nearly so. It was in 1927 that a group of California gas companies together with Standard Oil Co. of California produced an odorant which they called Cal-Odorant No. 1. The principal disadvantage of this odorant was that it would drop out in the line at pressures of 10 psig. Cal-Odorant No. 3 was brought on the market in 1928. This product was found to carry through 30 miles

of mains and would not drop out at pressures up to 100 psig.

It was during the two years 1928 and 1929 that Mr. Smith checked many samples of odorants and researched for information regarding them and their injection into the gas pipelines. By January 1930 an odorizing program of the company's gas properties had been developed. Oil fogging equipment to atomize the odorant was purchased and installed in the town border stations of a number of the larger towns. These odorizers proved successful and were in general use in the industry where gas was being odorized. Later in the same year a lubricator type of odorizer, which included a Lunkenheimer sight feed valve for determining amounts of odorant injection, was tried and proved superior to the fogger. It permitted adjustment of the rate of odor injection to conform to the varying demand requirements. With this improved odorizer, this company was the first, or among the first, to have complete odorization of distribution gas.

The success of the gas odorizing program brought other manufacturers into the odorant field. This competition promoted tremendous researches into the subject and resulted in continual improvement of the product.

The year 1932 brought the development of a concentrated type of odorant. The gas industry applied the term "concentrate" to an odorant that was used in quantities of 1 lb or less per MMcf as opposed to the "dilute" type which required 2 to 3 gal. per MMcf. The advantages of this odorant were obvious: less freight cost, less labor and time of handling, and the odorant was an improved type. Since the odorant was much more concentrated, quantity control for variable rates of gas flow became much more critical. The result was development of the wick-type odorizer.

H. M. Frederickson did a prodigious amount of research on odorization of the gas at transmission line pressure. He felt that this type of odorizing would add greater economy and safety because it would include the farmline and industrial customers as well as those receiving gas from the town distribution systems. In April 1934, the first transmission line odorizer was put into operation on the Cabin Creek-Glendive line. After some minor changes and adjustments, accurate control was possible, and the entire odorization program was changed over to high pressure odorization.

Today the company odorizes at transmission line pressures. We also have a few booster odorizers for lateral lines as well as a number of stand-by odorizers on distribution systems that may get partially odorized gas and it is necessary to boost the odor level to an acceptable impact plateau. Every customer to whom the company sells at retail, whether the small residential or the large industrial, buys odorized gas.

As previously mentioned, oil fogging equipment was used at first for odor injection. The lubricator drip-type odorizer was also used extensively, but its primary disadvantage was the need for constant attention. The wick-type odorizers which were popular for a time were quite successful. Their big disadvantage is that dirt, oil and other substances cake the wick. The odorizer then becomes inoperative and requires considerable time and effort to rework or "regenerate" it.

By and large this company has adopted the bypass-type odorizer. With the development of flat distillation curve odorants with insignificant residuals, the bypass odorizer lends itself beautifully to uniform odorization. In a bypass odorizer a small portion of the gas is diverted from the main stream flow by use of pressure differential. This differential may be created by a plug valve or an orifice plate in the mainline. We even use an elbow in the line to create a differential. The diverted portion of the gas passes over the odorant in a separate supply tank becoming saturated. When it is returned to the mainline it mixes with the unodorized gas. Flow control valves are used to control the amount of the gas to be bypassed. By properly designing such an odorizer it is only necessary to check the odorant level periodically and to fill the tank every six months to two years. This type of odorizer requires practically no attention.

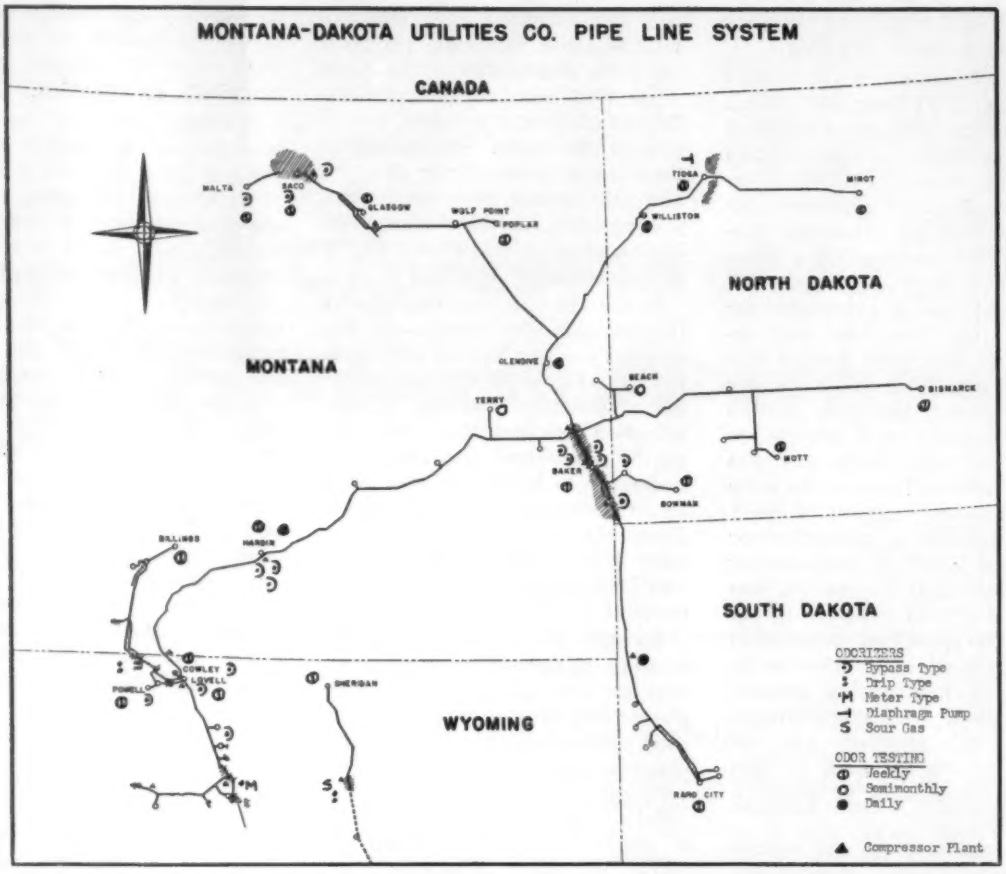
Perhaps the best automatic odorizer on the market today is the gas meter-type odorizer. This odorizer uses an orifice plate to obtain a bypass gas stream. The bypass gas passes through a standard gas meter which is articulated to an Archimedes pump which pumps the odorant from a sump into the bypass and on into the mainline. This odorizer has only one disadvantage: the operation of the meter is dependent on a differential. At mainline gas flows of less than 20 to 25 per cent of the design flow, the accuracy of the proportioning equipment drops radically. The company has one of these giving excellent service at one of our main purchase points where the gas flow rate is nearly constant.

Another odorizer which will give entirely satisfactory service is the direct liquid injection pump. This is powered by an electric motor, and by use of a check valve system pumps the odorant into the line against maximum line pressures. This type odorizer, too, has the distinct disadvantage of not being able to measure out small enough volumes for low gas flows and requires electrical current to operate the motor. We operate one of these and in the service where it is used, it is entirely satisfactory.

There are many other types of odorizers on the market. One quite often used is the flexible diaphragm pump type. Frequently its construction allows manual adjustment of the piston stroke length during operation or it can be done automatically by the use of proper auxiliary devices. The company operates one of these at a principal gas supply point. While it is new to us (we have only had it about two years), we feel that it has definite possibilities of performing adequately.

To summarize, the company operates the following odorizing equipment:

16—Bypass type
1—Drip type
1—Gas meter type
1—Direct liquid injection type



1—Flexible diaphragm pump type
1—Sour gas injection

We choose our odorants for their odor characteristics. Our primary requirements are that an odorant shall not be toxic; shall be detectable at very low concentration; shall not liquefy at high line pressures and normal operating temperatures; shall have a distinct gassy smell and that it shall contribute a minimum of sulfur to the gas. We also require that the odor shall not resemble the ordinary household smells, nor form harmful or odorous combustion products. Other desirable qualities will unfold with this tale which may require certain compromises.

Generally speaking, a mercaptan-type odorant has the desirable characteristic gassy smell and is otherwise satisfactory in varying degrees. For this and other reasons, mercaptans have been probably most extensively used as odorants over the years. Since the mercaptans used are "straight-line" or unsaturated hydrocarbons, they are quite readily oxidized into nonodorous compounds, normally identified as disulldes, especially in the presence of oxygen or in high heat zones.

Due to purchase commitments, we use air for Btu stabilization and interchangeability characteristics for a portion of the gas we transport. We have found in this case a tendency toward erratic odorization of this gas due to oxidation of the odorant. For that reason, we have searched diligently for an odorant that is more stable in the presence of air and oxides. During the past two years one of the odorant manufacturers has done a tremendous amount of research in other compounds. We have been testing both aliphatic and cyclic sulfide odorants for stability. These are the "ring" or saturated hydrocarbons and are completely stable in the presence of air and/or oxides as well as high pressures. So far we have had somewhat indifferent success with these and at present are back on mercaptans. The primary objection which we have to the sulfides is that our customers, as well as our own personnel, do not uniformly associate the odor impact of a sulfide, which is probably due to their long association with mercaptan odorants. We get reactions of "minty," "garlic," "rotten eggs," etc., too often to satisfy us that the present sulfide odorants are the complete replacement answer.

Another problem which has come up to face us with mercaptan odorants within the last five years is that of corrosion of pilot lines, pilot orifices and heads, especially in the appliances with the higher heats in the combustion zones. Laboratory analyses indicate formation of mercaptides, their usual form being a fine black or gray dust, or a hard, gritty deposit which builds up on the orifices. Both types of mate-

rial eventually shut off the flow of gas to the pilot. This phenomenon has had characteristics of acceleration in recent years, possibly with the advent of low Btu pilots and automatic or centerpoint ignitions. Much of this trouble may possibly be obviated, at least to a great extent, by substitution of suitable materials for the copper and brass in pilot lines, orifices and pilot heads.

I wish it were possible to recommend an odorant compound without any reservations. It seems that the best that can be said is to pay your money and take your choice. The mercaptans are the "gassy" ones, but who knows but that some of the sulfides might be more desirable for your purposes. Perhaps with the research going on presently, the manufacturers may come up with something yet unheard of. To those of you who will snort and say mercaptans with oxidation inhibitors are the answer, I would like to reply that up to the present they have not done a completely satisfactory job for us.

We have done considerable work on what concentration of odorant will give the best results. In our own experience we find best results are obtained when a "definite" or "strong" odor is obtained at 0.5 per cent concentration of odorized gas in air. This is approximately 10 per cent of the lower explosive limits of the gas which we distribute. It has also been found that this concentration gives us the optimum in leak complaints while at the same time satisfactorily limiting the nuisance calls. We follow the rule that the human nose identifies odor intensity in proportion to the logarithm of the amount of odor present.

Odor intensity tests are taken weekly at 20 strategic locations of which 13 are taken with an instrument and seven are room tests, volumetric basis. In addition, two locations get an instrument test twice each month and at two line booster type compressor plants the odor intensity test is taken daily by instrument. By staggering the tests during the working week, a check is obtained every working day somewhere on the Montana-Dakota system.

In the cases of instrument testing, a check or substitute room test is required at least once during a calendar month where arrangements can be made to obtain a suitable room. In instrument testing we use two methods. One method we call the threshold odor perception method. The other method is to set predetermined readings on the instrument rotameter corresponding to .125 per cent, .250 per cent and .500 per cent concentration of odorized gas in air and have the witnesses each sniff the instrument and record their reaction individually. This latter method is not to be always done in the order mentioned, nor continuously in the same order since it tends to predetermine the answer. The threshold method is to take two readings: the first, at the point of odor perception or threshold; the second, when the instrument gives off a definite or strong odor. Personally I prefer the threshold method since the witness is completely unaware of the reading on the rotameter at any time.

For the room test we use a room of 1500 to 2000 cu ft of content into which is released the amount of gas for a predetermined concentration after which the witnesses walk in and observe their reaction. Although this is the more difficult method of odor testing, it is probably the one most nearly approaching conditions likely to be met on customers' premises.

In all cases three witnesses are used in addition to the party in charge of the test. The individual in charge does not witness odor intensity since his is the responsibility of setting up and conducting the act. All odor tests are made in accordance with accepted practices.

For check purposes we strive to use different witnesses for the weekly tests. We also have available to us a Titrilog which is an instrument that continuously titrates the sulfur compounds in the gas and records its findings. Our instrument is capable of recording concentration of three compounds, including mercaptans. We have found the Titrilog to be accurate but its cost prohibits its use of this instrument except for major stations. This machine draws an accurate record of sulfur (odor) content of the gas but it has the distinct disadvantage of not recording the smell of the gas.

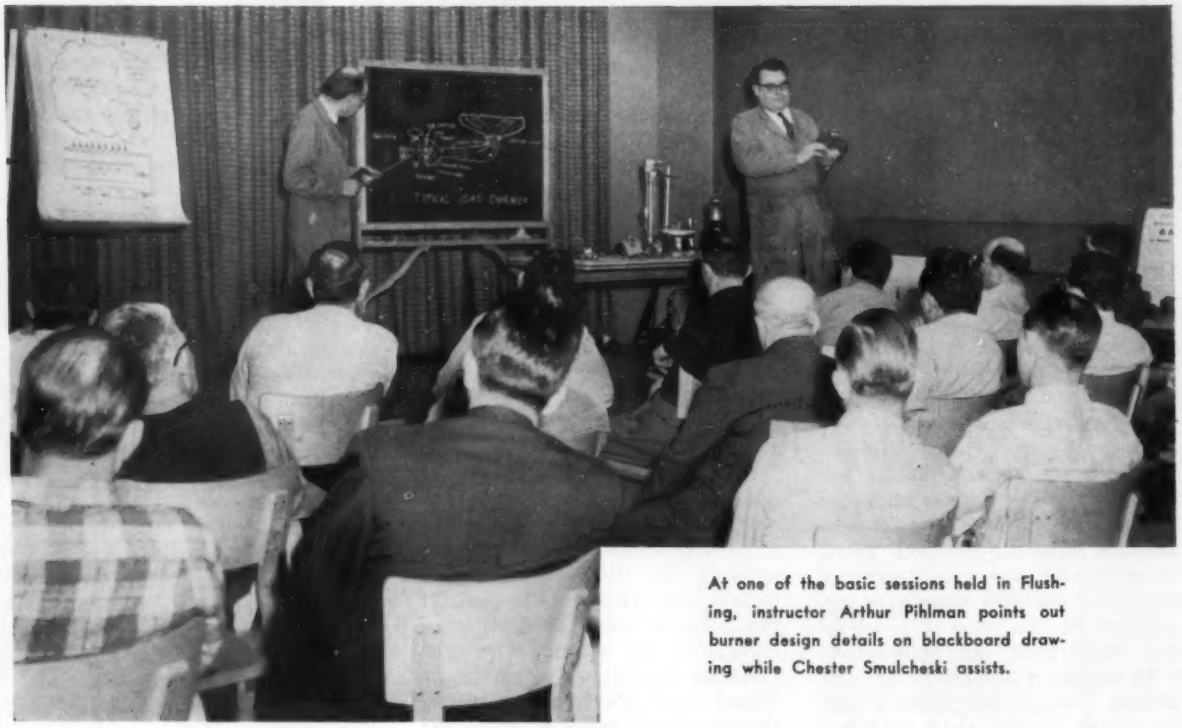
The company has developed and put into practice an odorization program which includes all the latest recommended practices as well as some of our own. New odorants, techniques and equipment are continually being tested. We have used a representative type of all the major classes of odorizing equipment, from the drip type to the proportional injection pump and including the Titrilog.

The bypass odorizer has been accepted as the standard or norm because of its simplicity, economy, and ease of operation and maintenance. The company practices the latest methods, including those of handling the odorant and application of neutralizing or masking agents for any spillage. Excellent agents are now available on the market. We are continually working with and spurring on the odorant manufacturers to produce products that have improved stability as well as desirable odor impact characteristics.

Complete records of odorization and odor testing practices have been compiled since 1949. We have found these invaluable in litigations.

Montana-Dakota Utilities Co. has pioneered in the field and will continue to do so in the future. The company odorizes over 1230 miles of gas main at the transmission pressures and successfully transports odorized gas to the customer. It has been our experience that odorized gas stored underground in depleted gas wells loses little or none of its odor.

In addition to our odor injection and testing methods, we condition new mains by the injection of raw odorant. This practice is limited to new distribution systems and to extensions which are of rather major proportions. Excellent reports of the practices of others on odor conditioning of new mains have been published. ■



At one of the basic sessions held in Flushing, instructor Arthur Pihlman points out burner design details on blackboard drawing while Chester Smulcheski assists.

Service training, sales go hand in hand at Con Edison

By WILLIAM W. CLARK • Eastern Editor

This month GAS takes a different approach in its continuing series on "What the serviceman should know about appliance controls." This article describes how Consolidated Edison Co. of New York, which does no service work of its own, insures its customers of first class service by training service crews of plumbing firms, dealers and contractors. In a subsequent issue, GAS will scrutinize the operations of a company which services appliances and controls with its own crews.

GAS staff report

AT Consolidated Edison, the training of servicemen is a function of the sales department. It's proving to be one of the best sales tools in the company's kit.

The New York utility doesn't merchandise appliances, nor does it service them. Therefore, the control it is able to exercise over sales, installation, and proper functioning is tenuous. It hangs by the slender threads that tie the company to in-

dependent merchants, installers, and servicing organizations.

But the threads are strong, being constantly reinforced with new selling aids, "diagnostic" activities, and the highly successful servicemen's training program.

Con Edison has all the problems of those utilities that do not merchandise, compounded by its no-service policy. These are problems of fairly recent origin, and it's only been in the past five years that bold steps have been taken to solve them. The withdrawal from direct selling began in the late '30s, following consolidation of the various predecessor companies. The process was gradual and wasn't completed until about the time World War II started. Servicing was not abandoned until after the war, and then it was accomplished in two steps: first, the elimination of free servicing (a service charge was established in the company's rate schedule), and second, the elimination of all servicing.

This last step was taken in July 1953. To fill the void, the company made arrangements to act as a clearing house for service requests. A list of servicing organizations (some 25 existed at that time, throughout the Con Edison territory) which would be on call for 24 hours per day was compiled. When a customer called the company's telephone bureau, she was advised to summon her own plumber; if she knew no plumber, or was unable to contact him, she was referred to a listed servicing company.

This was a defensive plan at best. Con Edison was little more than a middleman. Although many of the servicing companies had been organized by ex-Edison employees, the utility had no strings on them. They were controlled by the city, not by the utility.

It looked as if Con Edison had cut its last tie with its market. It no longer had any direct dealings with its customers except in billing them. To one who didn't realize what was hatching in the Con Edison sales department, it might have appeared that gas in New York City was going the way of the dodo. (And natural gas, at that!)

The sales department, however, had plans for building load, and it especially had designs on house-

GAS HEATING INSTALLATION AND EXAMINATION REPORT

ADDRESS _____ TYPE PREMISES _____

CUSTOMER _____ PHONE _____

OTHER GAS APPL.	
RANGE	
WATER HEATER	
REFRIGERATOR	
CLOTHES DRYER	

PLUMBER OR CONTRACTOR _____ DATE TO PLUMBER _____

ADDRESS _____ PHONE _____

REQUIRED RADIATION _____ SQ.FT. (St. Equiv.) INSTALLED RADIATION _____ SQ.FT. (St. Equiv.)

DOMESTIC WATER COIL _____ SQ.FT. (St. Equiv.) BTU INPUT _____ M

EQUIPMENT RECOMMENDED _____

DATE _____ Dist. OFFICE _____ BUS. REP. _____ EXT. _____

FIELD REPORT

1. Gas Heat Equip: Make _____ Model # _____ Input Rating _____ Btu/Hr
   Gas Designed ☐ Conversion ☐ Converted Boiler Make _____ Model # _____
2. Water Heater: Make _____ Model # _____
3. Type of System: Steam ☐ Hot Water ☐ ☐ (G F) Warm Air ☐ ☐ (G F) Unit Heater ☐
4. Thermostat Location: _____ Good _____ Poor _____
5. Heat Element Correct: Yes ☐ No ☐
6. Limit Control Setting: On _____ Off _____
7. Fan or Pump Control Setting: On _____ Off _____
8. App'l Gas Regulator Vents to: _____
9. Chimney: Type _____ Lined: Yes _____ No _____ Size _____
10. Flue Pipe Size _____ Diverter: Size _____ Type _____
11. Pilot Timing: On _____ Off _____
12. Gas Input: Recommended _____ Found _____ Left _____
13. Manifold Pressure: _____
14. Fyrite Test
    As Found: CO_2 _____ % Flue Temp _____ Eff. _____ %
    As Left: CO_2 _____ % Flue Temp _____ Eff. _____ %
15. Size Meter _____ No. _____ Date Set _____ HP ☐
    Set Index _____ Present Index _____ Service Size _____ LP ☐
16. Heating System Defects (if any) _____
17. Customer Instructed: Yes ___ No ___ 9 Tip Booklet Left: Yes ___ No ___

DATE OF INSTALLATION _____

DATE OF FIRST USE _____ BY _____ DATE _____
Technical Services Div.

44444
10-25-56

This is the gas heating installation and examination report which is filled out by the business representative.

heating. Here was the company's biggest single unsold market, and it began to go after it with both hands. Immediately it ran into a well-defined sales resistance, which had been built up through the efforts of the oil heat competition. In familiar fashion, the oil dealers had resorted to every trick in the book to forestall the invasion of gas into their own provinces.

One of the best ways to break this down, Con Edison decided, was to make aggressive merchandisers of plumbers who handled gas heating. To bring this about, four broad programs were needed:

First, a "climate" had to be created in which the plumbers could find ready customer acceptance.

Second, the company had to participate on the sales front.

Third, a system of double-checking on installations was needed.

Fourth, Con Edison had to train installers and servicemen to give the customer the best, most economical, and safest jobs possible.

The plumbers went right down the line with the utility. They remembered well what happened to them in the halcyon days of oil heat. When it was first introduced to the market, they were indifferent toward it, with the result that a whole new class of merchants, specializing in oil heat came into being. The plumbers lost a market that might have been theirs, and they weren't willing to let history

repeat itself with gas.

When Con Edison decided to create a "climate" of customer acceptance for gas heating, it refused to settle for conventional means of advertising. Edison wanted women to talk to each other about gas—over the back fence, so to speak. Radio, newspaper, and TV advertising—which the company used—were not in themselves enough to spark any housewifely gossip. Something unique was needed.

Thus "Hey Charlie" was born. "Charlie" is a 29-minute movie in color, in which the story of gas househeating is played out by professional actors. The "theaters" where Charlie has played are private homes. The pattern used is the "hostess" party, but the pitchman has been eliminated from the scene.

Here's how it worked: Edison company representatives solicited housewives to have a party, inviting 10 friends. The utility provided the refreshments—sandwiches and cookies—and showed the "Hey Charlie" movie. The hostess was given an appliance for her trouble. No pitch was given to the assembled ladies, except that each was invited to have her own "Hey Charlie" party.

One of five girls in Con Edison's sales department ran the show. At the end of the film, she handed out her calling card to the guests. That was all.

So successful was this "chain-letter" technique that in less than three years, more than 70,000 women saw the show.

This was soft-sell at its refined best. Con Edison counted on the women in each audience to respond, and they have. When one calls the company expressing interest in househeating, a business representative is sent out.

Enter now the second phase of the program, participation on the sales front. When the business representative calls, he conducts a full-fledged heating survey and comes up with recommendations for a system. When the customer is convinced that he wants gas heat for his home, he negotiates the final selection of type, size and cost of equipment and its installation with his own plumber. If the customer has no regular plumber, the BR assists in the selection of a plumber from a list of those who are active in the sale and installation of gas heating.

At this point, the business representative fills out a gas heating installation and examination report, a copy of which is given to George Boldt, supervisor of the company's technical service division, or his opposite number in the Westchester division. The supervisor in turn hands the report to one of his field men (who double in brass as training instructors) for follow-through.

The field man calls on the plumber, checks specifications, goes over the plans with him, and finds out when he is scheduled to start the job. He points out facets of the installation that might be changed to improve performance. While he has no "policing" authority, he is able to exercise considerable influence at this point.

He also finds out about when the job will be completed and the gas turned on, and arranges to be on the scene. At that time he assists in making a flue gas analysis (on conversion burners), checks the plumber's work, and gives the entire system a check-out for performance.

He also talks at length with the customer, explaining the operation of the system, telling her how she can get service on the appliance when needed and what she should do to keep it in good operating condition. Before he goes, he leaves with her a copy of a Con Edison publication, "9 Tips to Save Heating Dollars."

If it's not possible, because of conflicting schedules, for a field man to call at the time the installation is being made, he will arrange to examine the job at some later date. If he finds any faults in the system, he will write the plumber urging him to rectify them. This letter usually suffices; but if it doesn't, the field man takes it up with the customer directly.

This diagnostic service is about the closest thing to "policing" that Con Edison does, but it has proved highly effective. In view of the broad assistance rendered the plumber, he is usually willing to cooperate.

Obviously, the program couldn't stop here. Con Edison wanted to take every precaution to make sure the plumber himself knew how to do the job right. This meant that a training program, sponsored by the utility, was needed.

It had to be a continuing program, so the first step was to set up permanent training centers. Three company buildings, one in the Bronx (serving the central area), one in Flushing, and one in White Plains, were remodeled and refitted. A modern classroom was set up in each, complete with a full line of live equipment—ranges, dryers, water heaters, space and unit heaters, boilers, warm air heating units, etc. Several cutaway models were included. All appliances were consigned by cooperating manufacturers.

Control panels complete with controls and accessories, some in cutaway, were also furnished, as were meters. Each classroom was set up for movie projection. A comprehensive library of appliance, control, and servicing information was collected from manufacturers.

In setting up the courses, Con Edison hoped that manufacturers would be interested in participating, but the company both wrote and conducted its own courses.

Since the field men were Con Edison's contact with plumbers and servicing organizations, they were chosen as instructors. It was felt that they were most familiar with the installers' problems, and could tailor their presentations somewhat to answer these problems. Mr. Boldt has 11 field men on his staff, and they were assigned to conduct the first schools in Flushing and the Bronx. At White Plains, H. G. Schaul, Boldt's opposite number, has his own crew of 11 field men-instructors.

The first course was set up to cover basic fundamentals of gas appliance installation and servicing of gas space heating equipment. Two-and-one-half-hour sessions were held one night each week for 10 consecutive weeks. The first five covered installation, the second five space heating servicing.

The first five parts of the course were chiefly lectures. Each instructor followed the written material fairly closely, adding some thoughts of his own and supporting the lessons with demonstrations. The sec-

Training course on gas appliance installation

Session 1
- Types of gas supplied—natural and manufactured
- Heat content—Btu and specific gravity
- Fundamentals of combustion
- Burner parts and their function in combustion
- Gas piping and meters, sizing and installation
- Venting and ventilation, sizing and installation

Session 2
- Gas appliances
- Burner design
- Installation practice and adjustment of
  - Domestic Ranges
  - Water Heaters
  - Laundry Dryers
  - Room Heaters

Session 3
- Description of central heating systems—steam, hot water, warm air natural and forced circulation systems
- Determination of correct size
- Gas designed appliances for central heating systems
  - Boilers
  - Furnaces
- Installation practice for gas designed central heating appliances
- Controls for designed equipment and their functions
- Adjustment of gas designed equipment
- Unit heaters—selection and location
- Unit heaters—controls and their adjustment

Session 4
- Conversion of central heating boilers to gas firing
- Gas conversion burners—types and their application

Installation practice
- Controls for conversion burners and their functions
- Adjustment of gas conversion burners
- Flue gas analysis and use of Fyrite CO_2 indicator

Session 5
- Turn-on of space heating equipment—checking various controls
- General review and discussion
- Final examination

ond group of five sessions consisted almost entirely of demonstrations.

Several classes were conducted concurrently, enabling the company to give this basic training to about 1500 "students" in its first year. Both the plumber-proprietors and their union employees participated.

Examinations were given at the end of the fifth and 10th sessions. There were no homework assignments, but the students were given three "textbooks" for future reference: "American Standard, Installation of Gas Piping and Gas Appliances in Buildings"; A Guide for Installers of Gas Central Heating Systems, Conversion Burners, Floor Furnaces, Vented Space Heaters, Unit Heaters," a publication sponsored by the AGA House Heating Committee, and "Requirements for Installation of Domestic Gas Conversion Burners," The ASA Standard.

When they completed the course, they were also given the "Service Manual for Gas Space Heating Systems," a Con Edison publication.

The basic 10-lesson course is still being given, and will continue to be offered while there is a need for it. It is open to all interested persons in the plumbing and servicing trades.

When the first basic courses were completed, demand began to grow for advanced courses. Plumbers wanted more intensive training in the technical aspects of controls servicing such as wiring, testing, and servicing. The utility felt this was the type of training that the manufacturers were best fitted to give, since each company's special designs would need to be covered in detail. Yet this was the type of program that Con Edison should coordinate in order to assure continuity and good scheduling.

The upshot was that, after working with manufacturers through the summer and early fall of 1957, the utility came up with two new courses. One was a complete service course in Minneapolis-Honeywell controls. The first session, devoted to elementary electricity as applied to control circuits, was handled by utility personnel. The succeeding nine sessions were presented by M-H.

The second advanced course was a package affair in which seven manufacturers participated. This was a broader course, covering the application, installation, and servicing of unit heaters, appliance venting, and space heating control equipment.

The two courses opened in October 1957, and ran concurrently, one in the Bronx and the other in White Plains and Flushing. Con Edison handled all arrangements, including the mailing of notices to prospective students. Completion of the basic course was prerequisite for enrollment.

A $5 fee was also established for these courses as a psychological drawing card. Con Edison knew

Training course on space heating equipment service

Session 1—Direct Controls

Session 2—Indirect Controls

Session 3—Application of Control Systems

Session 4—Trouble Shooting—The students are given the problem of correcting simulated faults such as found in normal servicing work in the field.

Session 5—Trouble Shooting (continued)
1 Hour—Exam

Texts: Heating Systems and Equipment—Section III supplemented by Service Manual for Space Heating Systems—Part III

Service course on Minneapolis-Honeywell controls

Session 1

Elementary electricity as applied to control circuits

Presented by Con Edison

Session 2

Series 10, Theory, Conversion of series 10 systems to series 80 equipment

Thermostats

T86A—Mounting, Differential settings, Location, Service Tips

T852A—Mounting, Contact care, Wiring, Transformers, 3 wire hookup, Clock replacements, Differentials

T44A—Mounting, Load, Contact, care, Accuracy, Differentials

T42A—Mounting, Load, Accuracy, Differentials, Mercury switch replacements.

TA42A—Mounting, Load, Accuracy, Differentials, Micro switch replacement.

Session 3

Limit Controls

L4006A—Response time, Differential, Check switch, Well installation, Applications (H.L. — L.L. — R.A. — Unit Heat)

L444A—Lag, Differential, Replacement of mercury switch, Test for calibration application

L6006A—Internal switching action, Differential location

L6047—Internal wiring, Differential contact care, Testing circuitry

L8024—Internal wiring, Differential, Contact care, Testing circuitry, Additional contacts

L498B—Switch action, How to set, Location, Testing switch, Test for calibration, Differential.

L419A—Switch action, Location

L412A—Replacement of mercury switch

P404A—Location, Mercury switch replacement, Differential, Use of pigtail

Session 4

Gas Valves

V44A—Installation, Cleaning seat

V84A—Removal of head, Checking coil

V835A—Installation, Cleaning seat,

V435A—Removal of head, Check coil

V80—Installation, Cleaning seat, removal of head

V40—Oil fill mechanism, Checking coil

V87—Installation, Cleaning seat, Description of bleed

V88—Assembly, Checking coil

V855—Installation, Cleaning seat, Removal of power head, Testing motor

Session 5

Wall Relays, Pilots, Powerpile, Water Heater Thermostats

RA89

RA832

R182A

R182C

Internal circuit, Load. Contact care, Testing

Powerpile CS82 and CS893 principle of thermopile, Wiring practice

Type of thermostats, Heaters, Limit controls, Use of millivolt-meter-testing

Pilots and Thermocouples

Q303A—Application to burner, Stability, Linting, Porting

Q305A—B.T.U. outputs

Q308A

Q309—Testing with millivolt meter

Q10

Water Heater Thermostats

V5126—Installation, Cleaning of seat

V5124—Calibration, Testing

Session 6

Systems

Forced Hot Water (With Domestic Hot water)	How to choose proper controls, wiring of system, Testing system, Temperature settings, Locations, Differentials
Forced Hot Water (Without Domestic Hot Water)	Same
Forced Warm Air	Choosing proper controls, wiring system, Testing system, Temperature settings, location, differential, C.A.C.
Steam	Choosing proper controls, wiring, testing, setting

Session 7

Electronic Combustion Controls

RA890—Advantage of electronic, Internal circuitry,

RA190—Wiring, Testing, Use of Micro-ammeter, Flame rod Application.

Session 8

Electronic Moduflow

Y210A—Theory of electronic temperature sensing, Wiring, Locations, Testing thermostats relay and weathercaster, use of ohm meter.

Y710A—Installation, Wiring, Locations, Testing, Tube replacements, Ratio resistors.

Y710A—Same.

Y716A—Same.

Session 9

Zone Control

F.H.A. —Rulings.
Reasons for zoning.

F.H.W. —Valve system, Controls to use, Wiring, Installation of valve, Testing, valve, Cost savings, sequence of operation.

F.H.W. —Circulator system, Controls to use, Wiring Testing.

Forced
Warm Air—Theory of modulating damper actuarots, Internal Circuits, Reset controls, Wiring testing, Use of panels dampers.

Session 10

Outdoor Temperature Control Systems

Flatstat —Theory of outdoor control, choosing proper controls, Wiring, sequence of operation settings Testing.

Weatherstat—Theory and availability.

Heat
Stabilizer

Sessions 2 through 10 will be presented by Minneapolis-Honeywell Regulator Co.

Advanced appliance controls training course

Session 1

Gas Unit Heater

1—Application
2—Sizing
3—Installation
4—Servicing

Presentation by Carrier Corp.

Session 2

Appliance Venting

1—Research in venting
2—Venting review
venting operation, draft hood, tops, vent failures, correct venting, comparison of modern vents to chimneys and single wall pipe.
3—Use of vent tables
4—Why lined chimneys
5—Use of vents in apartment buildings
6—Summary

Presented by Metalbestos Division, William Wallace Co.

Session 3

Controls

1—Diaphragm gas valves
principle of operation, description of operating parts, application, servicing.
2—Metallic expansion type pilots
principle of operation, description of operation, application, servicing and adjustments.
3—Questions and answers

Session 4

Controls

1—Magnetic or Solenoid gas valves
principle of operation, description of component parts, application, servicing.
2—Liquid pilots
various types, principle of operation, application, testing, servicing.

Session 5

Control Systems

1—Steam
2—Forced hot water without domestic water coil
3—With domestic hot water coils
4—Wiring
5—Demonstration of sequence of operation

Sessions 3, 4, and 5 presented by White Rodgers Co.

Session 6

Controls

1—Thermostats
application, location, adjustments, problems.
2—Operating controls
warm air, hot water, steam, relay transformers, application, adjustments, settings.
3—Gas Valves
4—Wiring
5—Problems
6—Questions

Presented by Detroit Controls Corp.

Session 7

Low Water Cutoffs and Water Feeders

1—Selection
2—Sizing
3—Installation
4—Wiring
5—Methods of solving service problems

Presented by McDonnell & Miller, Inc.

Session 8

Outdoor Temperature Controls

1—Principle of operation
2—Installation
3—Adjustment and Servicing

Presented by Heat-Timer Corp.

Session 9

Controls

1—Self-generating systems
2—Water heater controls
3—Testing, settings and servicing

Session 10

Controls

1—Low voltage control systems
Warm air, Hot Water, Steam.
2—Wiring systems
3—Testing and servicing

Sessions 9 and 10 presented by General Controls Co.

that even a small fee would assure good attendance. At the end of the course, each student got his money back in the form of a giftwrapped set of Ridgid wrenches, which cost somewhat more than the entrance fee itself.

As time permits, additional courses will be established. Plans are well under way for two more courses in which 16 manufacturers will participate, some conducting one session, some two. These will cover such subjects as boilers, conversion burners, water heaters, venting, and unit heaters.

Meantime, the basic course and the two advanced courses will continue to be re-run as long as there is a demand for them.

But Con Edison has no intention of limiting the use of the training centers to formalized training courses. They are open to any manufacturer who wants to make good use of them. Already, other special classes have been held. Last fall and winter, American Standard used a center to introduce and demonstrate a new line of water heaters it was marketing. Ruud also used Flushing for a presentation of its one-week course in commercial water heating. This was moved in from its Kalamazoo (Mich.) school, and was held during the daytime to prevent conflict with evening activities.

What direction future activities will take is partly up to the manufacturers. The basic training program was originally conceived as a five-year plan during which Con Edison planned to extend the training to all persons who should have it. But, in actuality, training is a function that must go on and on. Not only will there be personnel turnover in years to come, but there will be new appliances, new controls, new equipment to be shown and explained. The utility offers an excellent medium for accomplishing this. ■

Next month GAS will continue its series on servicing appliance controls with an article titled "What the gas utility serviceman should know about water heater controls."

Computed flow telemetering

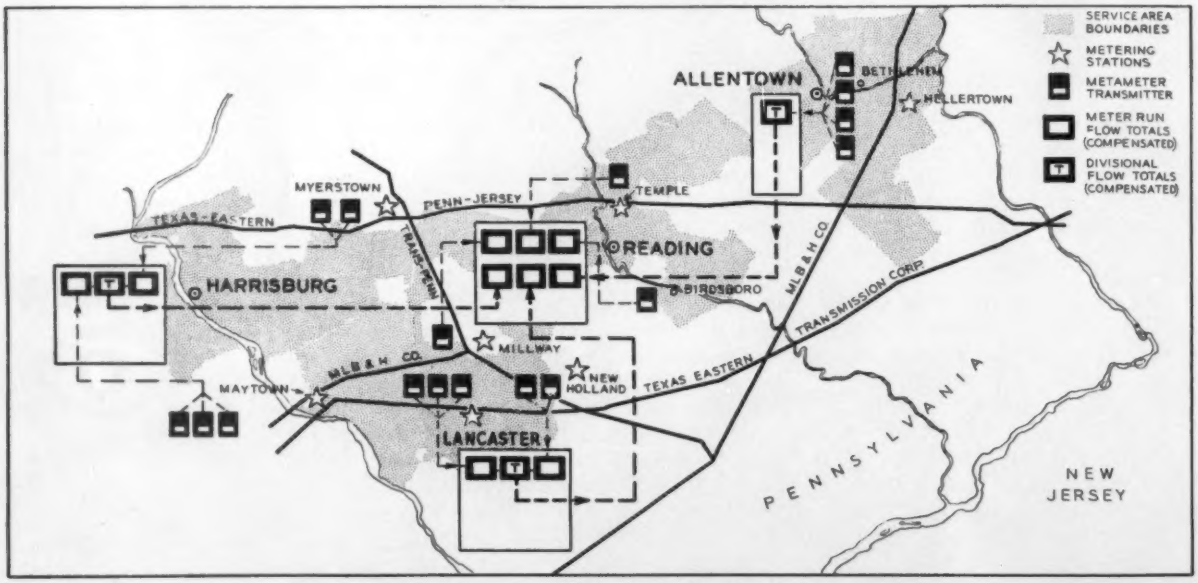
Centralization of flow information makes it possible for UGI to peak shave efficiently in its four major divisions during cold periods.

THE United Gas Improvement Co. services an area in the state of Pennsylvania, including such metropolitan centers as Allentown, Reading, Lancaster, and Harrisburg. It also operates the Philadelphia Gas Works under contract.

Essentially, the company has four major divisions. These cover specific areas of the state, including: Harrisburg Gas Division, Lancaster County Gas Division, Reading Gas Division, and Lehigh Valley Gas Division. Each of these divisions has its own dispatching personnel and facilities for distribution of gas in its operating area.

As the use of natural gas has spread in the area, due largely to the installation of residential house heaters (which have grown in number from 7400 in 1949 to 37,600 in 1957), and with the increasing amount of industrial activity making use of natural gas for heating and processing, it has become essential from an economic standpoint that dispatching the natural gas be centralized and better organized.

One of the major reasons for better centralization of information involved peak-shaving operations



Map shows the gas flow computing-totalizing telemetering system of UGI.

Main receiving panel (left) of the computing telemetering system at UGI's Reading headquarters. Lower three strip charts record corrected flow values from Harrisburg, Lancaster and Lehigh Valley divisions. Upper three recorders show corrected flow values from Reading division metering points. At right is an external view of the instrument house at Maytown.

during severe winter weather. The major gas-making facilities for peak-shaving are located in the Harrisburg division. There are also lesser facilities in the Lehigh Valley division for this purpose. However, without adequate information on the situation in each of the various divisions, it was almost impossible to allocate gas effectively between the various divisions in order to make the most efficient use of the gas-making facilities. In addition, even though all purchases of natural gas by UGI are billed by the Manufacturers Light & Heat Co., the number of take-off stations on both the Texas Eastern-Penn Jersey system and Manufacturers' own lines made it essential to have complete operating information from each of the divisions. Only in this way could receipts of gas be held within contract limit while gas was being sold at close to the maximum permissible volumes.

Therefore, it was determined that centralized telemetering was needed. Central dispatching headquarters were established at the Reading division, which was the most logical geographic choice.

The most effective use of telemetering could be made only if the flow measurements could be as completely processed as possible by the instrumentation, thereby reducing the number of calculations required. Bristol Co.'s flow computing system incorporated the following features, which appeared to fulfill this need. It would take orifice measurements; compensate them for the static pressure in the pipeline; add compensations for temperature, specific gravity, and supercompressibility; and then telemeter the compensated results to a totalizing instrument. The totalizers and computers would not only make a record of the actual flow measurement on the scene, but could retransmit this measurement to any desired location.

After more thorough investigation of this system, the company decided to install such equipment so that it would totalize the actual compensated total flow value from *each* of the metering stations in *each* of the four divisions. The totalized readings would be furnished to the dispatcher in the *divisional* headquarters, and then retransmitted to the central dispatching headquarters at Reading. The dispatcher at Reading, who would have overall control of the entire system, would thus be presented with a continuous indication of the current load in the entire system, and a permanent record on a chart of the trend of the total flow in each of the major divisions. He would also have an integrator (installed in conjunction with the recorders) with a count of the accumulated total for the day. These figures would be in terms of predetermined base conditions, and would thus be an accurate reflection of the actual quantity on which we would be billed at the end of the month by the supplier.

GAS exclusive

Thus, the dispatcher at the central headquarters would be able to avoid any unnecessary penalty costs in the use of natural gas. He would also be able to instruct the various divisions to take action required during any given weather situation to operate most efficiently. The Harrisburg division, naturally, would make the bulk of any gas during peak-shaving operations. And the Harrisburg allocation of natural gas would be directed to the other divisions as the need arose. The other divisions could also be advised to take holder losses to the extent deemed necessary by the Reading dispatcher.

Although the equipment for the entire system has not yet been in

operation during a complete heating season, enough results have been noted to more than justify the expenditure for this equipment. Results from the Lehigh Valley Gas division (which operated through the entire heating season last year) often came within 0.2 to 0.3 per cent of the billing meter readings for any given week or month, and an overall figure would probably work out to be less than 0.4 per cent. The other divisions came in later in the 1956-57 season with their telemetered data, but their results are almost as good. In every case, the divisional reporting has agreed to within 0.75 per cent of the billing meter total. This has been of great help in the dispatching operations.

Basically, the Bristol computing system utilizes a number of instruments. Most of them are installed at the metering station. There is an orifice differential pressure measuring instrument, which takes the differential pressure, extracts the square root and transmits it to a receiver, where this square root of "h" is multiplied by a meter factor (K). This converts the reading to a "Q" reference (Q_r). This meter factor (K) contains all the usual constants of a basic orifice formula, plus a built-in reference pressure and temperature which has been predetermined by the average conditions in the pipeline. Thus, the resulting figure represents a flow reading in the cubic feet of gas at the predetermined average conditions. (There is an orifice flow transmitter and the multiplying receiver for each meter run at the metering station.)

An electronic Dynamaster totalizing instrument then adds the flow readings from the various meter runs and gives a reading of (Q_r). If the line conditions through the system were at the predetermined average, conditions of temperature and pressure (Q_r) would represent the actual total number of cubic feet passing through this system. Since, however, these conditions are not usually at the average, they must be compensated for by additional instruments.

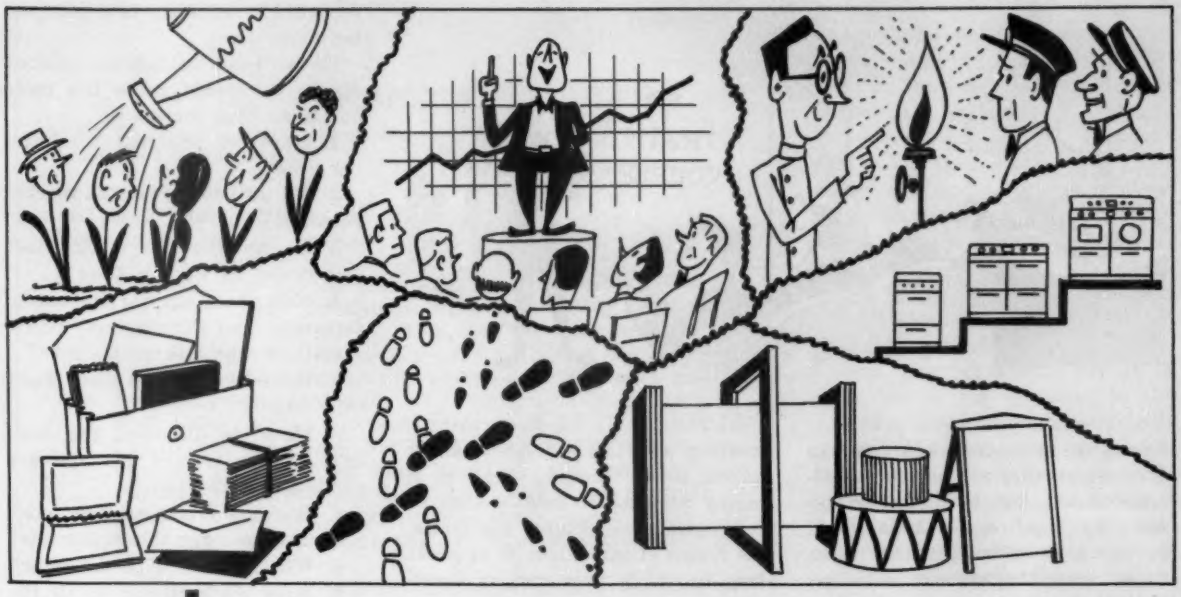
The actual pressure of the gas at the time of the flow measurement is measured in psia by a Metameter pressure transmitter on the common header, either upstream or downstream as desired. The square root of this pressure reading is extracted and then transmitted to another slide wire receiver, which is called a pressure corrector. Here the value of (Q_r), which has been received from the totalizer, is multiplied by the square root of static pressure (P_s), and divided by the square root of the reference pressure (P_r). This pressure-corrected value is then fed into a manual compensator instrument, which compensates for the specific gravity and deviation factor by means of manually set, calibrated dials. A temperature measuring transmitter takes the measurement of the flowing temperature of the gas, and transmits it to the slide wire receiver or temperature corrector where this compensation is also applied. The final compensated result then appears on the Dynamaster calculator indicator, and reads correctly in cubic feet of gas per hour at the standard conditions predetermined for the pipeline. This reading of corrected Q is simultaneously retransmitted over telephone wires to the dispatching headquarters at the divisional offices.

At the divisional offices this reading of corrected Q is recorded on a strip-chart recording instrument, which shows the trend of the actual gas load during the day, and it is also integrated on a 7-digit counter which gives the total corrected flow in cubic feet for the day.

This strip-chart record and the integrated count are used by the divisional dispatchers in operating their own systems; the corrected Q figures are also retransmitted from these divisional headquarters to the central dispatcher at Reading, where they are recorded on similar strip-chart instruments, as well as being integrated in the same fashion as at the divisional headquarters. (The Reading dispatcher thus receives totalized readings from three divisions, as well as individually totalized readings from his own three metering stations in the Reading Gas division.)

In its contract with Bristol, the company requested an accuracy guarantee of 1.5 per cent, as compared to the vendor's billing readings. After test operations, as well as a full heating season of operations for one of the divisions, the results have been well within this 1.5 per cent, and almost always under 1 per cent. ■

Transmitting and computing panel at Hellertown metering station of UGI's Lehigh Valley division.



How to build better appliance dealer relations

By D. O. BURDICK • Southern Counties Gas Co., Los Angeles

- PROSPECTS
- SALES TRAINING
- SERVICE TRAINING
- PROMOTIONAL IDEAS
- FLOOR TRAFFIC
- DISPLAYS
- UPGRADE SALES

What kind of people sell appliances?
Who are these appliance dealers?
How do they think and react?
What kind of people are they?

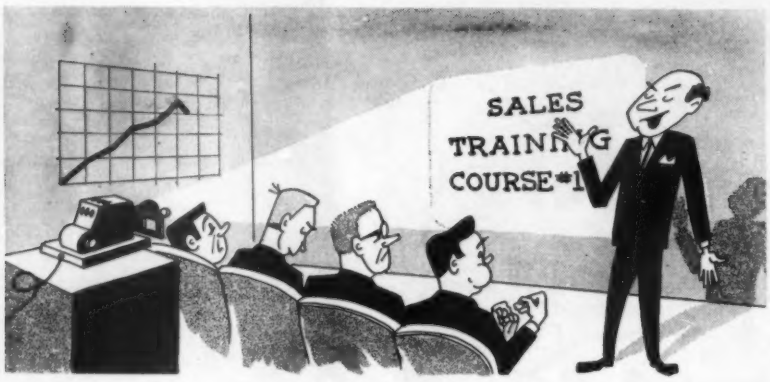
THESE are the questions a shrewd dealer contact man will ask himself. The answers to these questions have helped put utility men in a much better position to promote with dealers and have helped to overcome objections from dealers who will certainly be skeptical of someone trying to "help" them make more sales. Talk about "looking a gift horse in the mouth," the phrase was coined for the average appliance dealer.

Dealers on the whole are shrewd, self-reliant and independent. They are aloof from new ideas they don't quite understand. They tend to resist aggressive promotion because many of them have made their past successes in the days when customers demanded all the merchandise a dealer could lay his hands on.

Many of them have yet to realize that future successes will depend upon aggressive, well-directed competitive promotions. Sometimes, selling a promotion to a dealer is like selling $10 bills for $5—it's a hard thing to do! But, regardless of a dealer's success or lack of it, he can be classified very quickly into that group of people who ask the question:

"What's in it for me?"

You know, that's an interesting question. It is one that may well



be expressed subconsciously in one form or another not only by appliance dealers, but by almost everyone. Each of us, I think you'll agree, asks this question when faced with the various decisions that confront us in every-day living. But the most important situation giving rise to this question is the selling situation—whether a salesman is selling merchandise to a customer or a utility contact man is selling an idea to a dealer. The customer who could benefit from the merchandise or the dealer who could profit from a promotion idea has this question in front of him in big black letters—*What's in it for me?*

As far as a dealer is concerned, there may be several factors contributing to this show of skepticism. We'll just name a few.

1. He may have been engaged successfully in business for several years and feels that "he knows all the answers."

2. He may be much older than the utility man and subconsciously will downgrade the younger man's ideas.

3. He may not have complete confidence in the utility man's ability.

4. He may be like many of us. He hates changes. In other words, he has the I've-done-it-this-way-for-years attitude and, besides he's familiar with whatever has brought him even meager success, so why change?

Actually, when you look at it from a cold dollar-and-cents point of view, the dealer must ask this question, *What's in it for me?*, because if he can't see profit in doing something, he knows he's wasting his time. He just cannot afford to be wasting time in a highly competitive field—selling.

Knowing the dealer, his traits, his frame of mind, can be of great help to utility personnel in developing a sound promotional program for the dealer with the eventual goal—a better gas appliance merchandiser.

Let us be more specific and look at one hypothetical dealer, a man we may have just found out is now handling several lines of gas equipment, a man we have not previously had occasion or opportunity to contact. What's our next step? How about asking ourselves, "How should this dealer be approached?" A pretty fair question, isn't it?

Do we know enough about him? Maybe we should ask a few more questions, like these—

1. Have we analyzed his trading area?

2. Do we know what the market potential is in this area?

3. Do we know as much about this dealer as we can know?

4. How about the various manufacturers' and distributors' representatives who call on this man?

5. Have we talked to them about this dealer?

6. Have we discussed the dealer's attitude toward gas and gas appliances with them?

7. Have we found out how much product knowledge this dealer has?

8. What kind of a person is he?

9. Have we gathered in all the information available and planned our approach?

10. Is it a sound, logical approach?

11. Can we answer his question, "What's in it for me?"

12. Are we ready to sell him on cooperating with our dealer program?

It seems logical to assume—and it is proved to be true—that when these and other pertinent questions

PROSPECTS

SCENE: Dealer's store. Tom, the dealer, sits at his desk. Don, dealer contact man, enters.

Don: Hi, there, Tom.

Tom: Hello, Don. Come on over. Have a seat.

Tom (closing book of accounts, settling back): All right, that's finished. What brings you in today?

Don: You remember the last time I was here, you asked about receiving prospects. It seems to me you remarked about Blanchard's Appliances getting them and how many sales they've been making. You said you wanted to discuss the situation.

Tom: I was kind of wondering why all the dealers weren't getting a share of these prospects.

Don: Well, I don't assign prospects to every dealer, Tom. But I'd like to give you a few. But let me tell you a little about our prospect program. You know I get quite a few tips from company employees, and I try to qualify them as much as possible so that when a dealer does get one, he has better than an even chance to make a sale—if not now, maybe sometime in the future.

Of course, to keep employees enthusiastic over the program and, consequently, turning in tips regularly, it's important that you follow up on each tip quickly and give me information on what happened so I can tell our employees about their prospects. It's just as important, Tom, to give me information on no-sale prospects as it is on those that produce a sale. This kind of cooperation can mean more sales for you and happier employees, which keep the program going. So, to get prospects regularly, you must agree to "work" them. One of the reasons I want to have prospects is that you give gas equipment a fair shake. You display it in a good location. You have a representative number of appliances on display. You cooperate in promoting gas equipment. You go along with sales campaigns. And, you give good service!

To sum it up, Tom, I give these prospects to dealers who are aggressive and who try to help themselves by promoting gas equipment. In other words, I have to be sure that salesmen sell *gas* equipment when they call on one of these prospects.

Tom: That sounds reasonable to me. Sort of a two-way street. I'd like to try them for a while. Say . . . how many sales can I expect to get from these tips?

Don: Well, it varies anywhere from one sale out of five prospects to one in three. It depends a lot on how you and your salesmen follow up. I'd like to start you out with these two I brought along, and if your salesmen need any assistance in following up on them, just call on me.

Frankly, Tom, the biggest stumbling block has been the average salesman's reluctance to make a sales call at night. You know as well as I do that in a number of families, both the husband and wife work, and a night call is about the only solution.

Say, have you noticed that your new salesman, Bob, isn't too well grounded in gas equipment product knowledge? You know he could use some help along this line, and I noticed when I was in the other day that he tends to sell price and not quality. I'd like to help you out and see if I can give him some information on the appliances you sell and maybe a few tips on why *selling quality* will really pay off.

Tom: That sounds good to me! Why don't I give him these prospects and when he's ready to go see them he can give you a ring.

Don: Good deal. I'll be waiting for his call.

(Curtain)

can be answered to the satisfaction of the dealer contact man, he's well on his way toward success in solving the problem of selling the dealer on a promotional program. It goes without saying, of course, that when the actual approach is made, a friendly, sincere attitude certainly builds trust and confidence, and the dealer has the feeling that here is a guy who really knows what he is talking about and that working with him should certainly pay off.

Now, just for a little change of pace, let us put ourselves in the role of a dealer contact man. Let's assume that we have made our initial approach to this hypothetical dealer. Now that he knows a little about us and our company, and we've had a chance to size him up and determine just how accurate our pre-approach information was about him, the next question we better ask ourselves is—

How can I help this dealer?

What tools do I now have and what tools can I develop through my own initiative to help me promote with this particular dealer? It might be beneficial at this point to look at some of the tools which have proved to be basic in developing successful gas appliance merchandisers—tools that, if you are fortunate enough to have them, can be very helpful.

• Tool 1. Prospects

What more tangible assistance can a dealer receive than a qualified prospect for a sale? The key to success for both the dealer and the utility lies, of course, not so much in the *number* of prospects available, but in how the dealer *follows up* on them. *Skit I* shows how the dealer contact man handles the problem of putting the dealer on the preferred list to receive prospects.

• Tool 2. Sales training

Sales training and product knowledge are never-ending problems, especially with a new dealer who is unfamiliar with the benefits of gas and gas appliances.

Where else can such dealers get better sales training assistance than from a utility? This type of

assistance doesn't show the spectacular money-making results as quickly as a few appliance prospects, but many dealers and salesmen realize the value of continually reviewing salesmanship.

If you're fortunate enough to be able to use the more formalized programs such as the chef's cooking classes, the aggressive selling series, or a correspondence course, they can be very helpful.

But, equally effective assistance can be developed with a little initiative and by using information gleaned from the AGA Sales Maker booklets or from other trade publications.

Other successful methods of assisting dealers and their salesmen are the use of panel discussions, conferences, and brainstorming sessions using salesmen from different stores. You'll be surprised at the interchange of ideas that such activities will develop.

• Tool 3. Service training

You know the dealer has as much at stake as the utility in servicing every sale and installation he makes. A satisfied customer will be not only a repeat customer, but if the dealer "uses the user," he can from time to time pick up sales directly attributed to his satisfied customers. As far as the utility is concerned, of course, satisfied customers are essential to a growing usage of natural gas.

Dealers are actually appreciative of free training that helps their servicemen or servicing agency to do a better job. Poor installations mean excessive callbacks, dissatisfied customers, and lost profit.

The successful dealer representative does everything he can to help the dealer install gas appliances *properly* the *first* time.

• Tool 4. Promotional ideas

Another important form of assistance to dealers can be the development of promotional ideas, ideas to help the dealer:

1. Build traffic.
2. Create new customers.
3. Move lagging merchandise.

There are several ways in which a dealer representative can find successful promotions that dealers can use effectively to further their business. Some of the sources for ideas are:

1. AGA Promotion notes.
2. Manufacturers publications.
3. Trade magazines.
4. Other dealers' or gas companies' experiences.

Here is an example of the way the utility contact man (Don) sold the appliance dealer (Tom) on participating in a Launderama, a laundry equipment promotion. The dealer was told about:

1. Number of dealers participating.
2. Other participants.
   a. Colgate - Palmolive and gas company.
3. Explain Launderama.
   a. King-size laundry demonstration.
   b. Attendance (250).
   c. Place: civic auditorium.
   d. Program.
      (1) Laundry demonstrations by gas company.
      (2) Product demonstrations by dealers.
      (3) Entertainment—professional and amateur.
   e. Booths.
   f. Prizes.
   g. Direct mail.
   h. $50 trade-in.
   i. Tickets.
   j. Display materials.
   k. Expenses.
   l. Results.
      (1) Traffic in dealers' stores — approximately 200.
      (2) Sales—two dryers in show.
      (3) Total sales triple same period last year.
      (4) Prospects from show (30).
      (5) Dealer remarks: all dealers want another show.

Did you notice the step-by-step build-up used by the dealer contact representative? How he built dealer benefits into his pitch? How each little detail was covered, leaving very few questions unanswered? He made sure that the dealer understood the promotion, what his part in it would be, and what he could expect to gain. An aggressive dealer will usually buy such a package, just as Tom did, when he can see that it has been well organized and he knows that every effort will be made to produce a successful promotion.

• Tool 5. Floor traffic

Speaking of promotions, one of the hardest things to promote and one of the items most essential to a successful dealer operation is floor traffic.

It's as simple as this: The dealer can't sell 'em his product if he can't tell 'em about it. Many dealers need more floor traffic. A few use small-traffic merchandise such as sheet music, records, paint, hardware and other such items. But many only sell big ticket items, and these do not readily bring in floor traffic.

The dealer benefits of floor traffic are obvious:

1. It shows more people where his store is.
2. It makes new friends.
3. It gives him an opportunity to tell more people about his products.

FLOOR TRAFFIC

SCENE: McGowan's Appliance Store. Dealer contact man (Don) enters store, sees dealer (Tom) sitting at desk.

Don: How would you like me to give you a tip on selling customers who'll be coming in on that direct mail program you began yesterday?

Tom: Well, I can always use a good idea. What is it?

Don: Live demonstrators. You can really up-grade sales and put more action and punch in your sales pitch with a "live" range right here on the sales floor. You've been doing a good job selling top burner temperature control, but I'd like to explain a little demonstration that will really show a customer how quickly the flame adjusts itself to temperature changes. Come over to your range.

(Tom and Don move to range.)

Don: Now you've a gas line right over there. Why don't you just move this range over and hook it up or maybe run a little pipe over here and you're ready to go.

(Don takes bottle out of pocket.)

Here's how this gimmick works. Keep this bottle full of water on the range. When you bring the customer over, let her turn on the top burner temperature control to 150°. The flame comes on full but as the sensing disc reaches 150°, the flame decreases. When it reaches minimum, take the bottle of water and with an eye-dropper put several drops of water on the sensing disc. The flame immediately returns to maximum. It demonstrates the flame's quick response to small changes in temperature. Simple, eh?

Tom: Sure is easy enough to do. . . .

Don: Anybody can do it. It's often the simple things that really produce.

(Curtain)

If he has a large operation and hires enough salesmen, they can spend a portion of their time in the field, but many dealers do not have enough salesmen to do much field canvassing. They, therefore, must find ways to bring more people into their stores. Here are some of the ways successful dealers have accomplished this:

1. Home service demonstrations.
   a. Women's organizations.
2. Building own mailing lists.
3. Getting mailing lists from local utility.
4. Advertising.
   a. Utility schedule.
   b. Manufacturing mats.
   c. Tie-in with local or national promotions.
   d. Good newspaper relations.
      (1) Publicity.
5. Gimmick promotions.

There are undoubtedly many other successful ways to build traffic, but those few I named will give you an idea of a few successful ones. Let's say that a given dealer is successful in building floor traffic. What's he going to do with it? How will he turn it into dollars, profit?

One of the best ways to utilize floor traffic is to use a live demonstrator. *Skit 2* in McGowan's Appliance Store shows how the live demonstrator works with ranges.

There are a number of clever demo's a dealer can do to help tell the gas range story.

● Tool 6. Displays

The next logical step to building traffic in a dealer's store is to assist him in displaying his merchandise to the best advantage. Consequently, one of the most important links in developing better gas appliance merchandisers is good display. You know the first 20 seconds that a customer is exposed to merchandise is the critical period. How she reacts will determine whether she is interested enough to stop and look, or whether she moves on to another item. Since that first impression seems to be so important, then obviously, gas appliances should be given as much display prominence as possible.

There is a wealth of material available but little know-how on developing eye-catching, focal-point displays. This job of developing eye-catching displays is not an easy one as dealers have proved to be somewhat indifferent to store displays. Possibly because its use entails a certain amount of work. And, maybe, they don't understand just how a good display is developed nor do they always see the long-term benefits of a well-arranged store.

If the dealer will bear the cost, selling him on the idea of using floor displays can be equally profitable. Above all, remember that the utility representative can train himself in the technique of good sound focal-point displays. For example, by observing the principles used by department store window dressers, getting information from the library, studying pictures in trade publications, etc.

● Tool 7. Upgrade sales

There is one more vital area where the utility contact man can be of service to the dealers and his own company, and the illustration that proves the point ties right in with good display practices. The area I'm referring to is "upgrading sales." Every effort should be made to convince dealers that *quality* appliances pave the road to success and that *quality* is remembered long after price is forgotten.

The easy way is to cut the price, but a *good* salesman will sell benefits and advantages until the price becomes only of secondary importance. Once a salesman sells price, he falls into a dead-end trap with nothing left to sell. He's not a salesman, he's an order-taker.

Selling quality means:

1. More profit.
2. Long-term customer satisfaction.
3. Repeat customers.
4. More rapid-turnover, and
5. A healthier market potential.

In closing remember:

1. It's the personalized attention given each individual dealer and salesman that pays off and——

2. The appliance dealer is asking, "What's in it for me?" ■

This article is adapted from a talk given at the PCGA Northwest sales conference held in 1957.

Columbia seeks financing; fears Memphis decision

The sale of $30 million of new debentures at competitive bidding was approved by the board of directors of Columbia Gas System Inc.

President George S. Young said proceeds of this issue, and funds expected to be obtained through additional financing later in the year, will be used to defray the expenses of the company's $89 million construction program for the year.

However, Mr. Young added, the Memphis decision "could have a major effect on future construction plans" and reduce Columbia's anticipated spending for 1958 construction. Mr. Young also said that while the decision would have little effect on system earnings for 1957 and prior years ". . . it could have a serious effect upon future earnings if present rate-making procedures cannot be followed when increased costs require prompt offset by increased rates."

GAS · DISTRIBUTION NEWS

Manitoba accepts CGA Seal of Approval

The Province of Manitoba has accepted the Canadian Gas Association's Seal of Approval for gas-burning equipment.

Several weeks ago a delegation from the association, including H. C. Darroch, E. H. Rohrer, W. L. Dutton and W. H. Dalton, toured the provincial capitals of the western provinces. Their mission was to explain to government officials the progress being made by the approvals program.

According to Mr. Dalton, the delegation "was most cordially received by the various . . . officials as was the seal of approval."

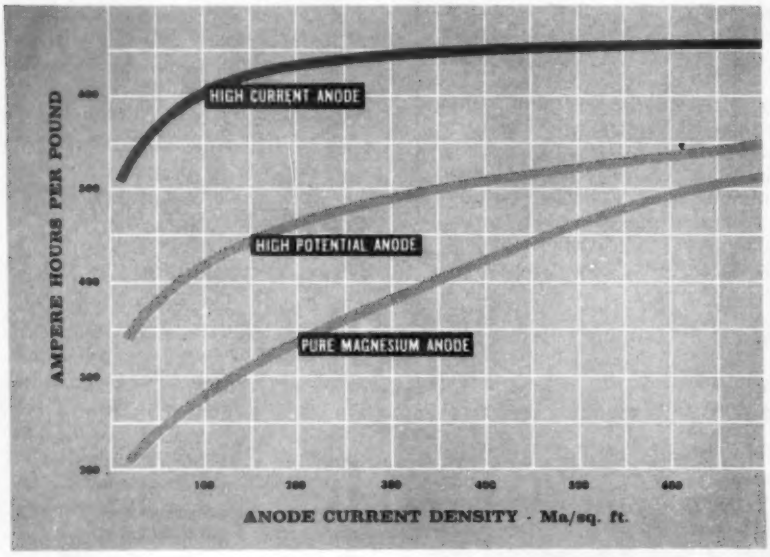
In a formal notice, from W. Elliott Wilson, deputy minister of labor for Manitoba, it was declared ". . . that, subject to conformity with the foregoing requirements and stipulation, and on the understanding that the Canadian Gas Association will effectively police the production, distribution and sale of appliances bearing the Canadian Gas Association Seal of Approval, the minister of labor of Manitoba hereby approves gas-burning equipment conforming to the foregoing and bearing the Canadian Gas Association Seal of Approval."

Northern Illinois moves to new division offices

Increasing demands for service in its service area resulted in Northern Illinois Gas Co. opening new division headquarters in Glenview, Ill.

Construction of the colonial styled brick office, stores department and service buildings on the 16-acre site began late in 1956. The general move of all operations from outmoded quarters in Evanston was accomplished overnight without interruption to vital services.

According to C. L. Mee, division manager, the rapid growth of new buildings in the suburbs west of Evanston resulted in the need for company operations moving closer to the center of population. Glen-



AVAILABLE NOW!

Standard Magnesium HIGH CURRENT Anodes

The most important consideration in the purchase of magnesium anodes is the anode efficiency. In other words how much actual protection do you get per dollar invested.

As can be seen from the graph, Standard Magnesium H-1 Alloy HIGH CURRENT anodes give far greater efficiency than any other available magnesium anode. This means they deliver more ampere hours of protection per pound of metal consumed — more protection per dollar invested. And with HIGH CURRENT anodes you save two ways. First, installation costs because Four Standard Magnesium H-1 Alloy HIGH CURRENT anodes will deliver as much current as six conventional anodes. Secondly because these HIGH CURRENT anodes cost no more than conventional anodes.

• • • • • •

On your next installation insist on Standard's H-1 alloy HIGH CURRENT anodes, field proved over a decade in millions of actual installations under all conditions.

For complete information describing advantages of HIGH CURRENT anodes write for FREE booklet BH 58.

QUALITY AND DEPENDABILITY THROUGH RESEARCH

Standard Magnesium Corporation
TULSA, OKLAHOMA

MAGNESIUM INGOT • MAGNESIUM ANODES • MELTING FLUX

THE ANSWER TO CONNECTION PROBLEMS

BRANCH CONNECTIONS

MADE UNDER PRESSURE

The best and most economical method of making lateral or branch connections is to use Smith All Mechanical Joint Tapping Sleeves and Valves or Stopper Pieces. This method ELIMINATES GAS SHUT OFF and the permanent, leak-proof installation is achieved speedily by employing these simple procedures: 1. Block Sleeve Outlet Half under pipe, position side flange gaskets, bolt Sleeve halves together. 2. Position end joint gaskets; install follower rings, bolts and nuts. 3. Rotate Sleeve outlet flange to desired position, tighten follower ring nuts. 4. Tighten side flange gasket compression screws. 5. Attach Tapping Valve. The installation is complete and ready for tapping. 5. (Alternate) Stopper Pieces may be used in place of Valves when connections are made to low pressure mains and permanent shut off Valves are not needed; however, the use of Tapping Valves is recommended. The cost of the connection is reduced by quicker installation, elimination of skilled labor and costly jointing material. Bulletin will be sent on request.

51

FIRE HYDRANTS · VALVES · SINCE 1896

THE A.P. SMITH MFG. CO.

EAST ORANGE, NEW JERSEY

view meets these requirements. The new headquarters houses facilities for administrative, sales, customer service, operating, stores, meter and transportation departments. Ample space for expansion is also provided.

Company schedules computer courses

A comprehensive schedule of spring and summer training courses in the use of electronic computers is offered by the Alwac Corp., Hawthorne, Calif.

Northern Illinois' new northern division headquarters in Glenview, Ill. was surrounded by snow (and covered, too) when this photo was taken.

William V. Crowley, western regional sales manager, said that several of the courses would be of an elementary nature, covering coding and relatively simple programming. Other courses will be of an advanced nature and will be restricted to professors, teachers, instructors and graduate students from colleges and universities.

The training series started in March and will run through August.

Plans made for shipping gas across the Atlantic

A recently formed company is building an experimental tanker to move liquefied natural gas across the Atlantic for distribution to customers in London.

According to reports from Sir Harold Smith, chairman of the British Gas Council, the new company — Constock Liquid Methane Corp.—has been organized by the Council and Constock Liquid Methane Corp. The latter is owned 50 per cent by Continental Oil Co. and 50 per cent by Chicago Stockyards Co.

In a joint announcement, L. F. McCollum, president of Continental, and William Wood Prince, president of the Chicago Stockyards, said the tanker is expected to be completed this year.

The gas council is putting up half the $4 million it will take to build the barge plus $1 million for a terminal in England.

The first gas to be shipped to England will be liquefied and loaded on the Gulf coast. The company is reportedly considering the possi-

leaky gas joints?

Excavating hundreds of feet of gas distribution lines just to repair leaking bell-and-spigot joints is a costly job. . . . It's an annoyance to your customers, too. There's a better way to do the job.

To solve the problem of natural gas leakage due to dried out joint packing, gas utilities have turned to CARBOSEAL Anti-Leak. By swelling the jute and hemp fibers as much as 44 per cent of their dry volume, CARBOSEAL Anti-Leak can *eliminate leakage* . . . with an estimated effective life of up to 25 years!

CARBOSEAL Anti-Leak is easy and inexpensive to use. Find out how other gas utilities have profited from this treatment. Write today for the booklet "Stop Gas-Main Leakage with CARBOSEAL Anti-Leak" . . . and the 16 mm. color-sound motion picture "CARBOSEAL Anti-Leak Stops Gas-Main Leakage" . . . address Dept. B.

UNION CARBIDE CHEMICALS COMPANY

CARBOSEAL ANTI-LEAK

Division of UNION CARBIDE *Corporation*

30 East 42nd Street, New York 17, New York

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal

The terms "Carboseal" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

bility of obtaining gas from the oil fields of the Middle East and Venezuela.

Ohio Fuel completes new central base radio system

Messages to nearly every section of Ohio and into Kentucky are beamed from Ohio Fuel Gas Co.'s new central base radio station. The station is located between New Albany and Newark, Ohio.

Atop the 300-ft tower is the coaxial-type antenna for the company's 250-watt station.

Paul W. Rogers, vice president and chief engineer, said the new station forms the heart of a two-way radio system that enables Ohio Fuel to speed up field operations and coordinate activities of its various departments. The new station cost about $17,000.

Ohio Fuel's FM radio network consists of 27 base stations and 162 mobile transmitter-receivers in company trucks and cars. In addition, the station is used by the Preston Oil Co., which, like Ohio Fuel, is a Columbia Gas System subsidiary. Preston has 21 two-way mobile radio units.

Ohio Fuel's first two-way radio system was installed in 1949 in east Columbus.

The new station operates automatically. Radio signals are relayed to and from the main transmitter and tower by microwave systems installed at Ohio Fuel's Columbus office and Preston's Newark office.

Ohio Fuel's Paul Rogers (right) and Arthur R. Goodman, communications superintendent for the company, discuss operation of a 250-watt transmitter at the new central base radio station.

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS

Onan ELECTRIC PLANTS

For keeping radio batteries charged . . .

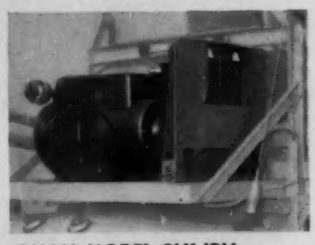
Truck-mounted Onan Electric Plant saves 6-10 gallons of gas per day!

Operates Onan Rectifier Battery Charger installed in truck body; delivers 2,000 watts A.C. for tools and lights

This 2KW Onan Plant, driven by a single-cylinder, air-cooled engine of 5 H.P. makes it unnecessary to run the 150 H.P. truck engine for battery charging. It saves gasoline and cuts down on truck engine maintenance. Savings of from $2.00 per day to $800.00 per year per truck have been reported. Moreover, the electric plant supplies 2 KW of *plug-in power* for electric saws, drills and lights used in construction and maintenance.

The installation above has the plant mounted over the truck cab. Other companies have installed units within the truck body. Onan air-cooled plants equipped with the optional, low-cost Vacu-Flo system *can be completely enclosed.*

There's an Onan Packaged Power system that can cut your costs substantially. Describe your need and let us help you.



ONAN MODEL 2LK-IRV shown with weatherproof steel housing removed. Mounting frame is attached to truck body. Plant is accessible for servicing. Entire unit can be transferred easily to new trucks. This plant is started electrically.

Special folder F-111 describes 3 Onan battery charging systems. Write or call.

D. W. ONAN & SONS INC.

3028A University Ave. S.E., Minneapolis 14, Minnesota

ELECTRIC PLANTS • AIR-COOLED ENGINES • KAB KOOLER • GENERATORS

Onan ELECTRIC PLANTS

Roots-Connersville doubles plant capacity

Roots-Connersville Blower, Division of Dresser Industries Inc., has just completed expansion of its main plant in Connersville, Ind.

The new integrated manufacturing department, occupying 40,000 sq ft, increases by 100 per cent manufacturing capacity for the company's line of rotary positive blowers, gas pumps, and displacement meters.

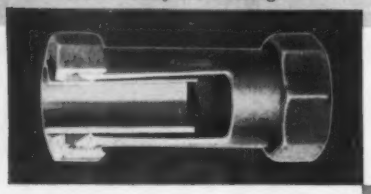
Modern, automatic metalworking machinery at the Roots-Connersville plant insures utmost precision in machining and assembly operations.

NORMAC

Couplings, Sleeves and Fittings

For UNIFORMITY ☆ DEPENDABILITY ☆ ADAPTABILITY

Normac gas distribution products are engineered and manufactured to meet every requirement of modern gas distribution. Write today for catalog.

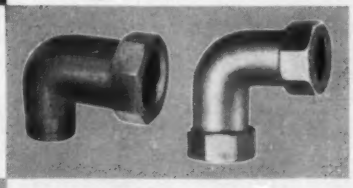


NORMAC COUPLINGS

Normac malleable couplings and sleeves offer the ultimate in deflection and strength with a center wall thickness greater than the wall thickness of the service pipe on which they are used. Every Normac fitting is individually air tested.

COMPRESSION-END "ELLS"

Normac ells of all types incorporate every feature of the Normac coupling plus full coupling depth.

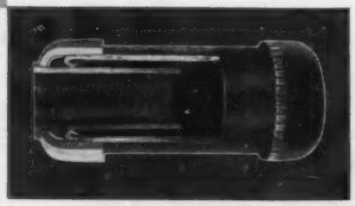


COMPRESSION-END SERVICE "TEE"

Full coupling depth. Special threads on male end prevent dropping into old hand taps.

NORMAC #50-A STEEL COUPLINGS

Manufactured from extra heavy wall pipe. Couplings are available with either seamless or welded centers in sizes from ¾" to 1¼" inclusive. 10" and special length centers available.



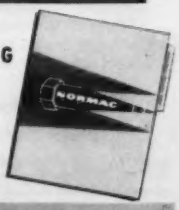
Normac also manufactures a complete line of red brass fittings in O. D. sizes: ⅜", ½", ⅝", ¾", 1⅛", 1⅜" — and a complete line of insulated couplings and fittings.

NORTON-McMURRAY Manufacturing Co.

919 North Michigan Avenue, Chicago 11, Illinois

New **CATALOG**

Write for your copy . . . it gives complete details and specifications of NORMAC equipment.



Couplings • Sleeves • Compression End Cocks • Brass Compression Fittings • Service Tees and Ells

IGT's summer session offers five courses

The Institute of Gas Technology is offering an enlarged summer session with five courses in natural gas technology.

The 7th annual summer session of IGT will be held from June 7-Aug. 15, according to Dr. Martin A. Elliott, director.

Two new courses available are "Natural Gas Distribution—Fundamentals," presented June 9-27, and "Natural Gas Distribution — Selected Topics." offered July 28-Aug. 15. The first course will be basic, while the second will be a modified course slanted to meet specialized needs of more experienced men in the gas industry.

Other courses include: Natural Gas Production and Processing, July 7-25; Natural Gas Transmission, June 9-27; and Natural Gas Fuel Utilization, July 7-25.

Instruction is at the college senior level and covers gas engineering fundamentals, current problems and practices of the gas industry, current research, and up-to-date methods and instruments of measurement and calculation.

SoCal completes new headquarters base

Recent ceremonies officially opened Southern California Gas Co.'s new multi-million dollar Pico-Rivera headquarters.

To date three buildings have been completed at the new site. The 108,000-sq ft main material supply warehouse, the 35,000-sq ft engineering headquarters building, and

the service station-garage are in full operation.

At the opening-day ceremonies, SoCal president and general manager F. M. Banks explained that the function of the new base is completely different from that of the company's new southeast division headquarters nearing completion in nearby Downey. "This headquarters," he pointed out, "will purchase, receive, store and deliver supplies to our entire system—as well as provide office facilities for several hundred employees. It is designed to serve the internal needs of our whole company, and so will have no direct contact with our customers.

"The soon-to-be-completed headquarters in Downey will be chiefly concerned with serving our customers' needs, and will serve as a division office . . ."

Gas heats almost 100% of new homes in St. Louis

Virtually all new homes built in the Greater S. Louis area during 1957 have gas heat and gas water heaters. This near-perfect saturation report comes from a continuing survey conducted by Laclede Gas Co.

Perfect or near perfect saturation in heating and water heating is reported month after month in surveys of new construction on

A new advertising medium — automobile license plates — has been developed in Washington. By special permission, Washington Natural Gas Co., Seattle, obtained the prefix GAS for all of its service automobiles when State of Washington switched to a license plate numbering system using a three-letter prefix. Here President Charles M. Sturkey admires one of the new plates.

Get all these advantages

with Parsons 150 Trenchliner

- 30 digging feeds from 12 inches up to 25 lineal feet per minute
- 6 trench widths from 16 to 26 inches; depths to 5¾ feet
- multiple depth selections with hydraulic digging-wheel control
- quick-change buckets, solid-type or tine-back, with gumbo lips or "Tap-In" teeth
- retractable bucket-cleaner sabre-type, with optional solid cutter
- controlled discharge, with reversible, shiftable belt conveyor
- standard tractor crawlers, with 16-inch treads, lug-type shoes; street pads optional
- 12-inch crawlers with flat shoes also available for city work
- choice of standard-make, gas or diesel engine
- All main gears enclosed in constant oil bath; all main shafts mounted on antifriction bearings

When your work schedules call for transmission lines between cities, or additional gas distribution and service lines in town, it will pay you to see what this Parsons 150 wheel-type Trenchliner can do for you. It meets a wide range of trench requirements — combines high-speed operation with exceptional grading accuracy.

Specified grades are easy to maintain. A hydraulic ram on vertical mast raises and lowers the digging wheel — gives fractional-inch depth adjustment, maintains close grade tolerance in toughest digging. Simple mast design eliminates unnecessary superstructure — gives low overhead clearance for work and travel. A separate hydraulic ram tilts the mast, balances weight of the wheel forward for traveling or trailer-loading.

Check the other 150 Trenchliner advantages listed here — then see Parsons distributor or write us. Larger wheel and ladder-type Trenchliners, and rubber tired Trenchmobile® also available.

What more facts?

mail to: **PARSONS Company, NEWTON, IOWA**

Send us bulletin on 150 wheel-type Trenchliner.

NAME_____ TITLE_____

COMPANY_____ DIV._____

STREET_____

CITY_____ STATE_____

P5SS GAS

PARSONS TRENCHLINERS®

(Featuring Subsidiary)

company lines by Laclede's market research office. For December, the results were: Househeating, 99.6 per cent; water heat, 100 per cent.

More and more new homes in the St. Louis area are equipped with gas built-in ranges, according to the survey. Of all new housing surveyed during December, 40 per cent had either gas or electric built-ins. Of this amount, the ratio of gas to electric was 2:1. For November, the built-in saturation was 38 per cent.

Enlarged facilities at Lancaster (Ohio) Meter Parts Co.'s plant increase production capacity and efficiency. The new addition houses larger stocks of materials and finished products and improved shipping facilities. Space formerly used for storage has been incorporated into the main production room, thus enlarging output of meter parts.

The 1957 report compares with an 18 per cent proportion of built-ins in new homes surveyed during December 1956; and 22 per cent for November of that year. The proportion of gas to electric at that time was somewhat less.

Gas dryers are continuing to sell considerably better than the national average, the survey reveals. Monthly checks during 1957 showed margins of less than 1½:1 in favor of electric. This compares with a national average of about 2½:1.

Oklahoma's measurement school on this month

Gas measurement, regulation, accounting and related subjects will be covered at the 1958 Southwestern Gas Measurement Short course scheduled for April 15-17. The three-day school will be held on the North Campus of the University of Oklahoma in Norman.

Principal speaker at the opening session will be Leslie T. Fournier, vice president and treasurer of Panhandle Eastern Pipe Line Co., New York City.

R. F. Nowlin, United Gas Corp., chairman of the program subcommittee, reports that 91 classroom periods of 50 minutes each are included in the program. According to Mr. Nowlin, the subject matter is of such nature that the course would benefit everyone—from fieldman to executive.

Dr. W. H. Carson, dean of the

Reynolds OFFERS A NEW PERFECTED SAFETY CONTROL FOR ALL SERVICE REGULATORS

Reynolds' new Safety Control may be attached to any Reynolds spring type service regulator built in the last fifteen years.

GAS CONTROL SINCE 1892

* Prevent regulator from falling in a wide open position, thus limiting the amount of gas the safety seal has to pass.

* Enable the gas company to set the regulator for a certain demand and if a customer increases that, his outlet pressure would drop which would cause him to call the company and they can find out what his real demands are.

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA

College of Engineering at Oklahoma, is chairman of the executive committee.

GAS • News Notes

Rockwell Manufacturing Co.'s new West Coast plant and repair center is now in limited production in Porterville, Calif. The 106,000-sq ft facility is the first major industrial plant in the predominantly agricultural San Joaquin Valley community.

Heil-Quaker Corp., Lewisburg, Tenn., has appointed Northeastern Distributors, Inc., Cambridge, Mass. as a distributor. The company will handle the Quaker line in parts of New Hampshire and Massachusetts.

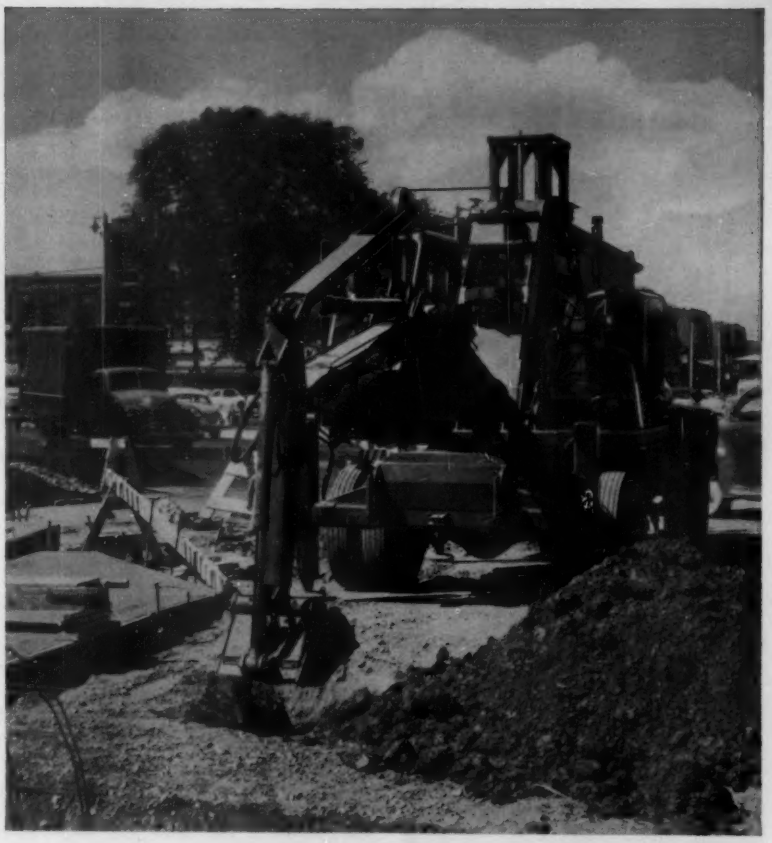
Bucyrus-Erie's 384-page illustrated book of the company's history was given a national award of merit by the American Association for State and Local History. The book, "Designed for Digging: The First 75 Years of Bucyrus-Erie Company," was described as "a good example of a scholarly and thorough business history of a Wisconsin company."

Albert C. Cope of the A. C. Cope Co., San Francisco, has been named representative of the Kitson Valve Division of the Welsbach Corp., Philadelphia. Mr. Cope will cover California, Nevada, and Utah.

All new Roper 20-, 30- and 36-in. gas ranges are now being built in the Kankakee, Ill. plant of the Geo. D. Roper Corp. and its parent, the Florence Stove Co. Production of 40-in. models is slated to start in Kankakee this month.

The Ray Welch Co., Hammond, Ind., is sales representative for Electro-Span digital supervisory control systems, according to the Pacific Division of Bendix Aviation Corp. The Welch company's territory covers northern Illinois and Indiana.

Cathodic Protection Service, Houston, is now distributing the complete Polyken polyethylene protective tape coating line. CPS maintains branch offices in Tulsa, New Orleans, Corpus Christi, and Odessa, Texas.



HYDROHOE Moves Dirt While Traffic Moves

Here's a hoe with hydraulic wrist action that trenches for gas mains or house connections, uncovers leaks, digs valve pits, sets pipe, handles most dirt-moving and lifting chores on busy city streets—*without* blocking traffic.

The all-hydraulic Hydrohoe supplies more digging and lifting capacity with less weight and in less space than ordinary machines. The Hydrohoe's extremely short tail swing and standard commercial truck mounting let it work along curbs and gutters in little more space than a parked car.

The Hydrohoe's light truck mounting lets you travel through traffic at regular truck speeds . . . up to 50 mph on the open highway. Hydraulic outriggers that extend and set in seconds provide bedrock stability . . . take all working stresses off the truck.

A choice of dipper sizes and types gives you unsurpassed versatility. For example, the 20-in. utilities dipper rotates from 45 degrees behind the handle to 50 degrees ahead . . . lets you dig short, deep holes with a minimum of waste time and effort.

Put this fast, compact, all-hydraulic Hydrohoe on your jobs soon. Your nearby Bucyrus-Erie distributor will supply details.

196H57

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

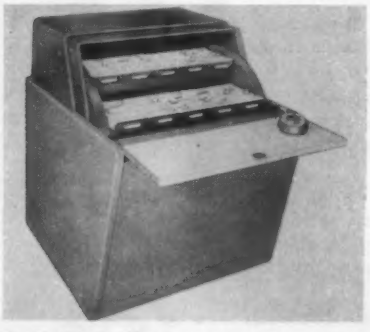
GAS DIGEST

New Products and Trade Literature

For more data on any of these items use the Readers' Service Card on pages 105, 106

1. Pipe finder

Fisher Research promises easier pipe finding and leak detecting through use of a new transistorized M-Scope combination pipe finder and leak detector. The new detector combines all the advantages available through new electronic techniques and materials.
Fisher Research Laboratories

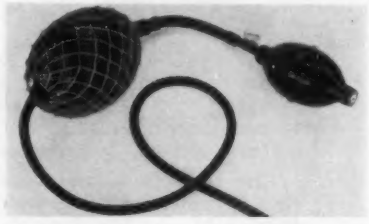


2. Rotary files

Diebold's new rotary file with Dial-A-File control makes finding the right record easier than dialing a phone. One flick of the dial brings records to operator's finger-tips. The dial has eight holes, one for each record pan. It can be turned in either direction to speed records to working level.
Diebold Inc.

3. Pipe thread compound

Recent improvements in Lake Chemical's Pipetite-Stik make it suitable for pressures up to 10,000 psi, temperatures to 750°F. The pipe thread compound, in handy stick form, can be used on all metal or ceramic threads. Its improved formulation makes it particularly effective for use on plastic threads.
Lake Chemical Co.

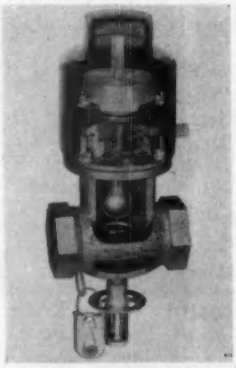


4. Manometer

A new manometer pressure bulb assembly field tests orifice meters, low pressure regulators, low pressure gauges, liquid levels and sources of low pressure air. The pressure bulb assembly consists of a hand pressure bulb equipped with a small bleeder valve which allows accurate control of reducing pressure at any selected point.
W. H. Curtin & Co.

5. Motor pump

A small, fast, portable hydraulic pump developing up to 10,000 psi pressure and weighing only 65 lb has been introduced by Tal Bending Equipment. In addition to being used with hydraulic benders, pipe pushers, knockout punches, and hydraulic jacks, the motor pump can be installed and adapted to give fast continuous power to existing equipment.
Tal Bending Equipment Inc.



6. Combination valve

Handley-Brown's new combination valve provides manual and automatic safety shutoff. Master Poly-Trol automatically shuts off gas in the event of excessive or inadequate pressure, high temperature, and flooding. In addition, it provides tamper-proof manual shutoff. It is installed ahead of the house regulator and meter.
Handley-Brown Heater Co.

7. Flashing alarm system

Electro Devices' annunciator units have been supplemented with a new model offering an integral flashing feature in each plug-in unit. Electro-Pane provides individual flashing at each station. Flasher failure will not cause malfunction at a number of alarm stations.
Electro Devices Inc.

8. Tractor transport

Moving a tractor, backhoe, front-end loader, forklift or other light industrial equipment is simplified with Fayette Manufacturing Co.'s Haulette tractor-transport. With the Haulette, equipment is hauled out to the job site with a pickup truck. Equipment is rolled on to the Haulette on steel ramps.

Fayette Manufacturing Co.

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9. Purge meter

Fischer & Porter's new purge meter features a removable snap-in tube and removable end fittings so that fittings and tube can be replaced in seconds without the use of tools. Also featured are a corrosion-proof fiberglass body, a 3-in. scale length, white backing on the tube for better visibility, and a snap-on protective lucite shield over the direct reading tube.

Fischer & Porter Co.

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10. Concealed oven venting

Concealed oven venting on built-in gas ranges is featured in Tappan's 1958 line. Replacing the vent is Tappan's new fleur-de-lis illuminated control panel. All controls are located at convenient eye level.

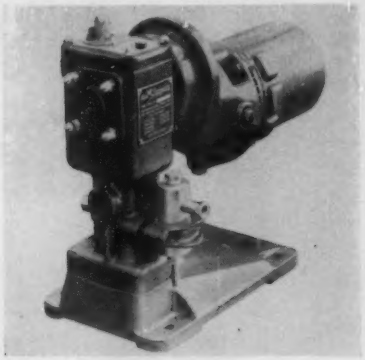
Tappan Co.

---

11. Forced air furnace

The Lennox Landmark forced warm air basement furnace features a new concept in design. Separate cabinets for the heating and blower-filter units are aligned with centering pins to give the appearance of a single cabinet assembly in the completed unit.

Lennox Industries Inc.



12. Metering pump

Hills-McCanna has developed a more compact model of its McCannameter metering and proportioning pump. The integral McCannameter actually takes only one-third the space previously required. The pump has continuous flow characteristics available through the entire capacity range. Capacity is adjustable while in operation, pumping at pressures up to 2500 psi.

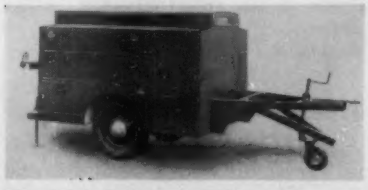
Hills-McCanna Co.

---

13. Line-up clamp

Lever grip, line-up clamp is used when welding together lengths of pipe and when making tie-in welds. It holds the pieces of pipe being joined in alignment during the welding operation. The action is such that it is unnecessary to hold the clamp once it is attached to the ends of the pipe.

A & H Engineering Co.



14. Maintenance trailer

A midwestern gas company designed the gas construction and maintenance trailer being built by Stahl Metal Products. Features include adjustable landing gear, adjustable rear jack to stabilize trailer when parked on job site, interior space for seating of 3 men, foreman's hinged desk top, windows, and heavy-duty pipe vise bracket.

Stahl Metal Products Co.

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15. Packaged appliances

Chambers has introduced a complete line of matched and packaged built-in kitchen appliances. Gas built-in ovens include models that have the Chambers retained-heat cooking feature. An all-feature unit and a budget oven are in the line. Gas surface cooking units include lift-top models that fit on bases, a 4-burner broiler waist-high unit, and a series of drop-in models.

Chambers Built-Ins Inc.

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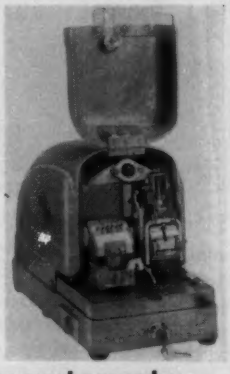
16. Radiotelephone

Kaar Engineering Corp.'s new FM mobile radiotelephone can be used between vehicles and fixed points, from one vehicle to another, and between two or more fixed points. It is available as a complete, single package unit or as a system containing the transmitter, receiver and power supply in one unit.

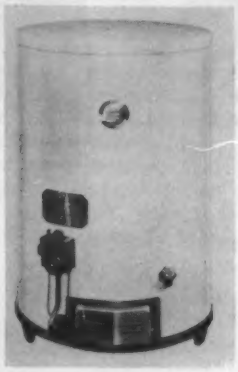
Kaar Engineering Corp.



17. Payment recorder

An electrically operated, motor-driven machine has been designed to record receipt of payment on postcard-type bills used with punch-card tabulating systems. The machine does the following in less than a second: perforates customer's receipt with paid, date, location number, etc.; prints stub with date and teller number; automati-

cally detaches stub from the receipt.
Heller-Roberts Mfg. Corp.



18. Water heater

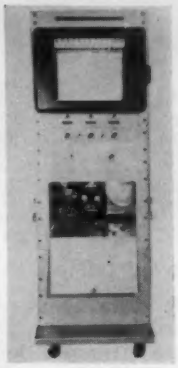
The Hide-A-Way automatic gas water heater has been designed by John Wood Co. to operate efficiently and economically in installations where headroom is limited. The streamlined 30-gal. unit will provide an abundant supply of hot water in minimum space locations.
John Wood Co.

19. Pressure logger

Automatic digital data logger scans sequentially 24 or 48 pressure lines into a single transducer. According to the manufacturer, extremely low switched volume results in high accurate pressure measurements by minimizing air flow disturbances at probe orifice, pressure drop at probe orifice and in pressure lines.
Hanson-Gorrill-Brian Inc.

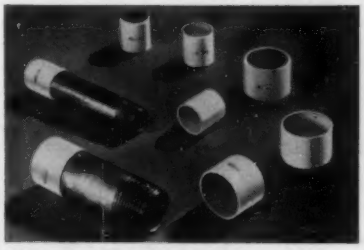
20. Water heater

Holly-General's new "5-Star General" water heater can be "built-in" with other cabinets or installed anywhere in the house. Temperature selector is located at eye level. New heating rate is achieved by means of two cast-iron burners with milled slots, "heat-wrapped" tank and geyser-action from a brass "Generiser" below the storage tank.
Holly-General Co.



21. Electronic integrator

An extremely fast counting rate is claimed for a new electronic integrator from Wheelco Instruments. The unit has been developed for use in chromatographic applications to measure the relative quantity of components in gas mixtures.
Wheelco Instruments Division



22. Protective caps

Recently developed thread protector caps snap on instantly, yet will not come off unless unscrewed. According to the manufacturer, this is done by means of a metal staple that snaps into and conforms to the thread pattern. Tecto-Caps are made from plastic-coated kraft paper.
Precision Paper Tube Co.

23. PVC flexible tubing

Carlon Products now has flexible tubing extruded from Kralastic and PVC. The product is light weight, flexible, and offers high working pressures. Unusually good chemical resistance over a wide temperature range is claimed. Working pressure of ¼-in. PVC tubing is rated at 565 psi at 73.4°F.
Carlon Products Corp.

24. Broiler that bakes

One of the top features in the 1958 Gaffers & Sattler line of gas ranges is the broiler that bakes. The new range has a high broiler and rotisserie oven convertible at the turn of a knob into an auxiliary baking oven by bringing into play a low burner. It makes simultaneous cooking in the regular oven and baking in the auxiliary oven possible.
Gaffers & Sattler

25. Vehicle desk

A handy 8x12-in. aluminum "desk" for dashboard mounting features its own "filing" basket. The desk can be easily detached from the dash so the driver can take it to job site. The 1-in. deep basket welded to the underside can be used to hold papers of already completed jobs. Attached ballpoint has its own holder.
Product Development Corp.

26. Home gas filter

A new home gas filter is designed to remove dirt, pipe scale, and other foreign matter from gas lines and keep customers' appliances operating efficiently. Staynew Model CPHB is installed in the customer's home upstream from the meter on low pressure systems, downstream from the meter in front of the regulator on high pressure systems.
Dollinger Corp.

FOR MORE INFORMATION

about New Products in this Issue . . . . .

Each New Product or Trade Literature item reviewed in this issue is numbered. Circle the corresponding numbers on the Readers' Service Card; then PRINT your name, title, company and address plainly and drop the card in the mails (no postage is needed).

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GAS DIGEST

27. One-man trencher

The new one-man trencher, the Trench-Devil, digs a trench 2-¾ in. wide and up to 20 in. deep. One man can transport the trencher to the job site, unload it, complete the work at hand, and load the unit unaided. At the 20-in. depth digging speed averages 6 ft/minute; at 12-in. depth digging speed is 15 ft/minute.
Arps Corp.

TRADE LITERATURE

28. Diaphragm pump

A heavy-duty, all-purpose, positive-displacement diaphragm pump for feeding of a wide variety of corrosive fluids is described in a bulletin.
Proportioneers Inc.

29. Fittings and Flanges

How to buy welding fittings and flanges is explained in a folder from Babcock & Wilcox.
Babcock & Wilcox Co.

30. Venturi meter tubes

Venturi tubes—their recovery characteristics, the formulae that determine their design, typical calculations—are covered in a new bulletin, which features diagrammatic sketches, comparison charts and graphs.
Builders-Providence Inc.

31. Blowers and gas pumps

Details on the increased capacity ratings of type AF rotary positive blowers and type XA rotary positive gas pumps are presented in Bulletin AF-XA-157. In addition to the rating tables, the catalog contains specifications and design data.
Roots-Connersville Blower

32. Materials management

Materials management control which reduces the investment in maintenance, repair and operating supplies is presented in a 10-page booklet (BSD-47).
Remington Rand

33. Valve selection

Cross-section illustrations highlight Barksdale's 56-page catalog. Among other features are simple graphs determining means of figuring pressure drop, discharge and velocity of liquids.
Barksdale Valves

34. Pipe supplies

Pipe repair clamps, pipe and meter couplings, cut-in tees and crosses, and saddles are among the products described in R. H. Baker's catalog of pipeline supplies and specialties.
R. H. Baker & Co. Inc.

35. General purpose computer

The simplified programming of the Bendix G-15 general purpose digital computer is described in a new illustrated bulletin.
Bendix Computer Division

36. Equipment catalog

A new, 3-color, 36-page illustrated catalog offers complete specifications and capacities for the entire Schield Bantam line of truck cranes and excavators.
Schield Bantam Co.

37. Forced air furnaces

Specially designed as an architects' and engineers' bulletin is Tamco's 1958 catalog featuring Clipper Imperial, Clipper and Clipper horizontal forced air gas furnaces.
Tamco Corp.

38. Electric plants

How one man, with an Onan portable electric plant, can do the work of a crew is explained and illustrated in a new folder.
D. W. Onan & Sons Inc.

39. Mobile radio history

Illustrated "case histories" of mobile radio systems operating in a broad range of industries, including utility operation, are presented in a brochure entitled "How Service Organizations Increase Efficiency with RCA Two-Way Radio."
Radio Corp. of America

40. Electrolytic hygrometer

Detailed information on an electrolytic hygrometer is presented in Bulletin EH-4001. The instrument is used to detect traces of water at dew points as low as -125°F in gas dryers, recycle gases, and welding and heat treating gases.
Beckman Process Instruments

41. Industrial equipment

Industrial gas burners, furnaces and accessories for heat treating, metal melting, soldering and drying are covered in a new bulletin which also presents latest data tables and work rate charts.
Charles A. Hones Inc.

42. Metering systems

The purpose, design and operation of Bailey metering and control systems are discussed in Bulletin 500. Included is discussion of pneumatic and electric telemetering and pneumatic control.
Bailey Meter Co.

43. Scrubbers

Four types of scrubbers are cataloged in Bulletin 600, which also presents a new line of Hi-eF purifiers, scrubbers, mist extractors, and separators for the gas industry.
V. D. Anderson Co.

44. Cathodic protection

High temperature derating curves for cathodic protection rectifiers are covered in Bulletin 257. These curves are of the new vacuum process, high current density, Petti-Sel selenium power rectifiers.
Radio Receptor Co. Inc.

45. Pipe inventory

Up-to-date listings of hard-to-locate pipe and tubing as well as valves, flanges, and fittings are presented in a service brochure.
Midcontinent Tube Service

46. Construction equipment

The history of Koehring Co. and its nine divisions, eight of which are in the construction field, is covered in a colorful 36-page illustrated catalog.
Koehring Co.

GAS ASSOCIATIONS

Washington state group reelects Charles Sturkey

Charles M. Sturkey, president of Washington Natural Gas Co., Seattle, has been elected to a third term as president of the Association of Washington Gas Utilities.

New vice presidents are Nathan H. Gellert, Jr., president of Spokane (Wash.) Natural Gas Co., and Edward Niederer, Jr., executive vice president and general manager of Pacific Natural Gas Co., Longview.

Elected secretary was William M. Little, executive vice president of Cascade Natural Gas Corp., Seattle. Leland E. Jones, vice president and southern division manager of Washington Natural in Tacoma, is treasurer.

Participating in the 1958 Home Service Workshop were (from left) Marideanne Wolfe, Minneapolis Gas Co.; Margaret Doughty, Dow Chemical Co.; Mrs. Marguerite Fenner, Pacific Gas & Electric; A. A. Barnhart, Cribben & Sexton Co.; and Eleanor Morrison, Michigan Consolidated Gas Co. Some 158 U. S. and Canadian cities were represented at the Minneapolis workshop.

Heavy-duty heater group seeks GAMA div. status

Manufacturers of heavy-duty forced air heating equipment seek division status in the Gas Appliance Manufacturers Association. The association's board will vote on the subject at its meeting in White Sulphur Springs on March 30.

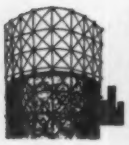
The new division would be for manufacturers who produce a heavy-duty forced air gas heater capable of producing in excess of 500,000 Btu per hour output.

The group has elected officers. They are headed by Walter L. Davidson, Dravo Corp., Pittsburgh. Vice chairman is M. Everett Barnard, Carrier Corp., and David R. Webster, Reznor Manufacturing Co., is executive committee member.

More than

2 MILLION FEET OF ½ INCH KRALOY SERVICE PIPE

already installed



Since 1945 more than two million feet of one-half inch Kraloy Plastic Pipe has been installed for natural gas service lines. This one-half inch PVC pipe has done a job superior to that of ¾ inch, and larger pipe, when made of other materials.

One-half inch Kraloy PVC Pipe can also supply more than an adequate volume of natural gas to your customers. Kraloy can do this because of its mirror-smooth interior walls which result in an extremely high C factor.

Other Kraloy advantages:

1. Kraloy is permanent—not subject to electrolysis, rot, rust or scale.
2. Kraloy's flexible strength allows it to be installed faster and easier.
3. Kraloy's lighter weight lets your trucks carry more pipe footage.
4. Kraloy delivers cleaner gas—reducing foreign deposits in jets, valves, etc.

WHEN YOU SPECIFY YOUR NEXT INSTALLATION, DO AS OTHER LEADING GAS COMPANIES DO...SPECIFY KRALOY PVC PLASTIC PIPE!

Representatives:
The Mask Company—Houston, Texas
H. J. Hodes—Kansas City, Mo.
The Crane Co.—Los Angeles & Denver
Southeastern Distributing Co.—Miami

Call, write or wire for detailed information and specifications.

KRALOY *plastic pipe co., inc.*
4720 East Washington Boulevard, Los Angeles, California
Subsidiary of the Seamless Rubber Co., a Rexall Drug Co. Subsidiary

Industrial, commercial gas meeting slated

April 8-10 are the dates of the 1958 AGA sales conference on industrial and commercial gas. The conference will be held in Milwaukee's Hotel Schroeder.

An interesting and worthwhile program is planned for attendants. Highlights will be papers on commercial incineration and air pollution, air conditioning, kitchen planning, and a presentation on getting the most out of industrial and commercial research.

Tuesday, April 8, will be Industrial Gas Day, when speakers and papers will cover subjects in that field. Wednesday's program will cover subjects of interest to both industrial and commercial gasmen. Commercial Gas Day is set for the last day of the conference, April 10.

Kate Niblack ends 37-year stint with Oklahoma group

Kate A. Niblack has retired after completing her 37th year with the Oklahoma Utilities Association.

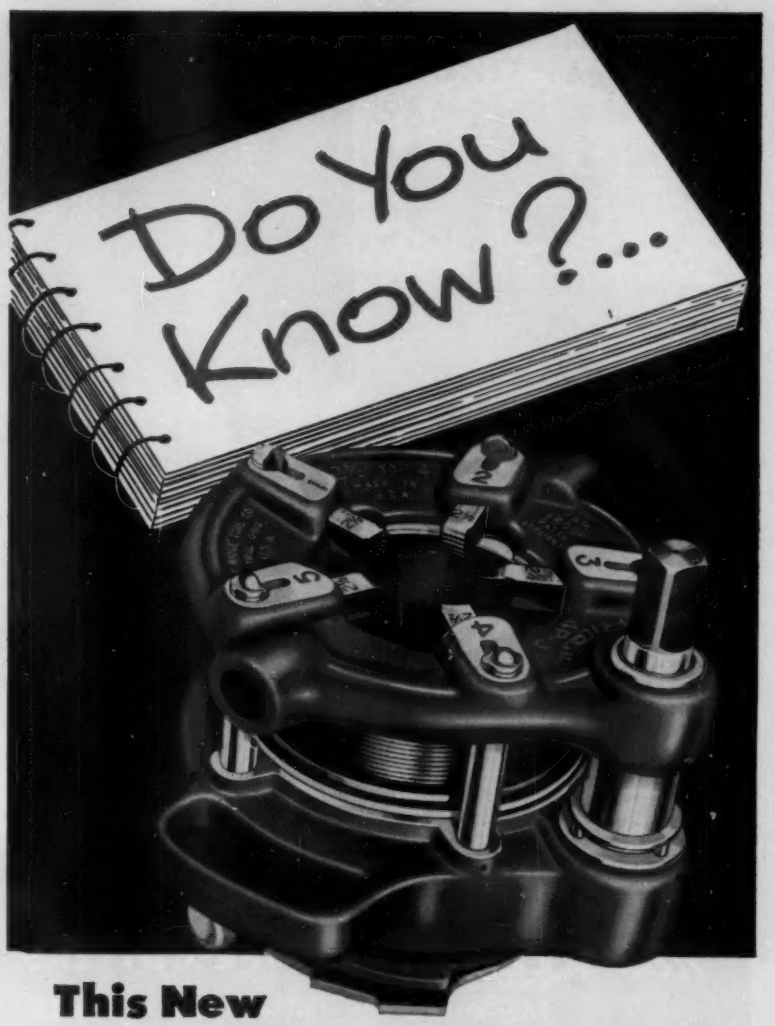
Miss Niblack was elected secretary and assistant treasurer of the association in 1936, one of the few women in the United States to hold this type of office. For 32 years she has been an active member of the general committee of the Southwestern Gas Measurement Short Course and has held various chairmanships on this committee.

Before going to Oklahoma in 1920, Miss Niblack was employed by a southern Indiana utility. She says that during World War I, when manpower was at a premium, she rode trolley cars to neighboring towns and read meters "to help out."

Thelma T. Jones, who succeeds Miss Niblack, has been with the Oklahoma Utilities Association for 21 years. For the past six she has served as assistant secretary.

Kate Niblack

Thelma Jones



This New

RIDGID 4PJ

is the only 2½" to 4" geared threader that's

Jam-Proof

It's safe—can't jam and knock equipment around when you thread pipe by power drive. Automatically kicks out after standard thread is cut. Workholder sets to size *before* putting on pipe — other easier work features. See it at your Supply House!

The Ridge Tool Company, Elyria, Ohio, U. S. A.

The SCF "Fence Rider" says

SCF consultants "Ride Fence" for gas companies, nationwide, locating and grading leaks by Vegetation Method, Safety or Combination surveys.

Southern Cross Foresters maintain "Extra hands," fully equipped and thoroughly trained to supplement your repair crews when needed.

SOUTHERN CROSS FORESTERS
Atlanta 6, Ga. MElrose 4-4227

Rear Admiral Charles C. Kirkpatrick (center), Chief of Information of the Navy Department, studies report of GAMA program during two-week briefing on major business and industrial PR programs. Here he meets with (from left): C. Stuart Hall, executive vice president of Carl Byoir & Associates, GAMA's PR counsel; H. Leigh Whitelaw, executive V-P of GAMA; Eugene Martin (standing) of Carl Byoir; Kalman B. Bruck, association account supervisor; and Robert Gardner, GAMA account staff member.

May 5-9 are dates of commercial gas school

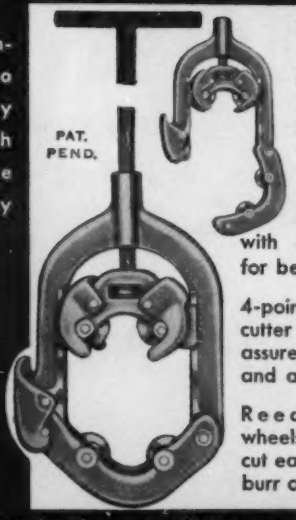
The AGA Commercial Gas School is scheduled for the Edgewater Beach Hotel in Chicago on May 5-9.

Covered will be information on the sale of air conditioning, kitchen exhaust requirements, and commercial incineration. The new standards of the National Sanitation Foundation for Cooking Equipment and Water Heating will come in for discussion.

In addition, this year there will be an exhibit of manufacturers' equipment in the lecture hall so that students can examine the models between sessions.

IF YOU CUT LARGE DIAMETER PIPE . . .
YOU NEED THESE
New REED HINGED 4-WHEEL PIPE CUTTERS
Four sizes cover the range from 2½" to 12"

Users tell us these completely new cutters are so efficient they often "pay for themselves" through the savings in crew time on a half-dozen cuts. They are the first really practical tools for cutting off steel or cast iron pipe in sizes from 2½" to 12". You can, for example, cut 8" steel pipe completely off in less than five minutes.



Four wheel design requires minimum swing of handle—less digging in ditch work, easier "tight-corner" cuts.

Closed frame permits light weight with complete rigidity for better cutting.

4-point guide aligns the cutter on the pipe . . . assures perfect tracking and a right angle cut.

Reed Razor Blade wheels track perfectly, cut easily and roll down burr on steel pipe.

Unconditionally guaranteed to be the most efficient cutter you have ever used. Ask your jobber or write for literature.

REED MANUFACTURING COMPANY
ERIE, PENNSYLVANIA • U. S. A.

Association Notes

"Gas builds a greater America" is the theme of the 40th annual convention of the AGA slated for Oct. 13-15 in Atlantic City, N. J. Alexander M. Beebee, chairman of the executive committee of Rochester (N. Y.) Gas & Electric Corp., is chairman of the general convention committee.

C. H. Abbott, treasurer of the Sprague Meter Co., Bridgeport, Conn., has been elected chairman of the GEM Committee, gas industry promotion group. Vice chairman is K. R. D. Wolfe of Fisher Governer Co., Marshalltown, Iowa. C. B. Dushane, Jr., American Meter Co., outgoing chairman, is serving as a member of the operating committee. Other committee members are Paul Kreuch, Rockwell Manufacturing Co., and E. C. Hemes, of Vulcan Rubber Products.

Robert W. Kollar has been named librarian at AGA headquarters in New York. Since 1952, Mr. Kollar has been librarian at the Cleveland laboratories.

GAS • PEOPLE

E. H. Tollefson
Consolidated

C. W. Cooper
Consolidated

WILLIAM A. DOUGHERTY has retired as chairman of the board and general counsel of Consolidated Natural Gas Co., New York. E. H. TOLLEFSON has been elected executive vice president and C. WILLIAM COOPER is general counsel. JAMES COMERFORD continues as president and chief executive officer. The post of chairman will not be filled. Mr. Dougherty has been a director and general counsel of Consolidated since its organization in 1943. During that time he was also a vice president until his election as chairman in 1956. Mr. Tollefson has been a director since 1954 and vice president in charge of planning and gas supply since 1956. He will continue to direct those activities. Mr. Cooper has been a vice president of Consolidated since 1943, assistant general counsel since 1951, and a director since 1955.

H. F. JACOBSMEYER has been named sales manager of Grayson Controls Division, Robertshaw-Fulton Controls Co. Mr. Jacobsmeyer, former district sales manager for Grayson, replaces A. W. Beck, who recently became marketing vice president.

ALVAN V. BRASHEAR has been elected a vice president and manager of operations of Michigan Consolidated Gas Co., Detroit. He has

A. V. Brashear
Michigan

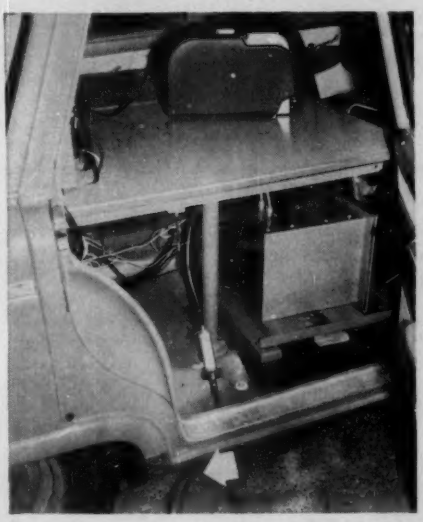
H. F. Jacobsmeyer
Grayson

INFRA-RED MOBILE UNIT PICKS UP ATMOSPHERE SAMPLES AND INDICATES GAS LEAKS ON CHARTS

Developed by Heath Survey Consultants to Improve Securing of Gas Leak Data . . .

Interior of Heath Infra-Red mobile unit, showing chart on which gas leaks are indicated. Instrument operator marks street locations on chart as vehicle travels.

To improve the efficiency of present leak detection methods, mobile infra-red gas analyzers have been developed by Heath Survey Consultants, Inc. As the mobile units are driven along city streets or transmission lines, escaping gas is picked up by suction tubes which protrude from the vehicles. The presence or absence of methane is recorded on a strip chart. Use of the mobile equipment makes leakage control safety surveys more complete and more thorough than previously possible.



Close-up photo shows one of the pick-up tubes (arrow) extending below car. Above tube is dust filter for removing impurities in the sample.

OVER 1,000,000 MILES OF MAINS SURVEYED

In the U. S. A. and Canada, the Heath firm has safety-surveyed over 1,000,000 miles of gas mains using several methods developed by Heath people after many years of experience with Winter Leakage surveys and Vegetation-Soil leak location surveys.

For additional information about Heath Leakage Control Safety Surveys, write to: HEATH SURVEY CONSULTANTS, INC., 573 Washington Street, Wellesley, Massachusetts.

S-700-L SYNTHETIC DIAPHRAGMS

for 1-A sprague gas meters

In thick or thin meter cases, new Lancaster S-700-L Synthetic Diaphragms can be centered and adjusted perfectly. The adjustable carrier wire and special center bracket are attached directly to the diaphragm!

Lancaster engineers have developed a new kind of material and a new diaphragm construction that withstand excessive flexing — a 'must' for Sprague or Ironclad meters.

No other material tested approaches the flexibility and low differential of the Lancaster S-700-L Synthetic Diaphragm! It's ready now for your 1-A Sprague Meters.

S-700-L Synthetic Diaphragm comes complete with carrier wire and gasket attached. Can be furnished without gaskets cemented to flange.

Not recommended for manufactured gas

Protect Meter Accuracy with Lancaster Index Repair Bushings, Neoprene Connection Washers, Diaphragm Oil, Dry Lubricant and Other Quality Products for Meter Care.

"A Meter is only as Accurate as its Parts"

Lancaster METER PARTS CO.

Manufacturers of Quality Parts for Gas Meters

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Canadian Representative: Ontor Limited, Toronto 2, Canada

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Firm _____

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City _____ Zone _____ State _____

people • *Continued*

held the post of manager of operations since November of last year. A veteran of 34 years of service, Mr. Brashear has worked in all phases of natural gas distribution operations. He became assistant manager of operations in 1953. PETER J. MONAGHAN has been elected to Mich Con's board of directors. He is a senior partner in the law firm of Monaghan & Monaghan & Crawmer. Michigan Consolidated also has appointed ALBERT F. MULLINS as assistant general manager of the Grand Rapids district. He will continue to serve as assistant treasurer of the company. ALBERT C. SCHROEDER, assistant secretary, is now consultant to General Manager Wallace M. Chamberlain.

DAVID M. HESKETT is now assistant superintendent of the Tucson (Ariz.) Gas, Electric Light & Power Co.'s gas department. In the newly created post, Mr. Heskett will assist C. H. Webber, vice president and superintendent of the gas department.

W. R. STEPHENS has been named president of Arkla Air Conditioning Corp., Evansville, Ind. Elected vice president was LES E. WALBRIDGE, Arkla general manager. B. E. HARRELL, a vice president of Arkansas Louisiana Gas Co., was named a new director and CARLISLE SCHRADER assistant treasurer.

CORNELIUS S. GOOCH has been appointed a service engineer for the Dallas office of B-I-F Industries Inc., Providence, R. I.

J. D. ROBERTS, vice president in charge of distribution for Mountain Fuel Supply Co., Salt Lake City, retired last month. A 30-year veteran of the gas industry in Utah, Mr. Roberts served as vice president and director of Mountain Fuel since 1935. Mr. Roberts will continue as a director of the company.

H. E. Ford
Northern Illinois

O. E. Fry
Northern Illinois

L. W. Tuttle
Northern Illinois

M. G. Markle
Northern Illinois

In a series of executive appointments, Northern Illinois Gas Co. elected HOWARD E. FORD vice president. The former assistant to the president of the Bellwood, Ill. company and vice president of Ni-Gas Supply Inc. will continue his present duties in the Ni-Gas subsidiary. Four new assistant vice presidents have been named. They are: LOREN W. TUTTLE, operations; CHARLES F. HENNESS, divisions; ORVILLE E. FRY, industrial relations; and RANDALL A. LIGHTBODY, management administration. Other key appointments made by Northern Illinois include: MATHEW G. MARKLE, succeeding Tuttle as manager of operation; C. JOSEPH GAUTHEIR, assistant manager of operation; DONALD B. MILLER, district manager of the Blue Island-Kankakee district; ROBERT J. EBY, commercial manager of central division; L. RAYMOND BILLETT, district operating superintendent in the Crystal Lake area; WALTER J. DAUNHEIMER, supervisor of industrial relations; and GEORGE T. JONES, supervisor of management development.

CROSBY BREZEE has been named assistant to the vice president and LEWIS S. JACKSON general sales manager for gas and electric sales of the Long Island Lighting Co.

Several promotions have been announced by Northern Ontario Natural Gas, Toronto. E. E. BAGLEY is chief of operations, E. C. BOVEY is assistant to the president, A. M.

R. A. Lightbody
Northern Illinois

C. F. Henness
Northern Illinois

The Cleveland 80W ...a real money maker

Does All 3 Jobs Better...with Only 1 Man

THE CLEVELAND TRENCHER CO.
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Good Everywhere

STOP H_2S CORROSION BEFORE IT STARTS!

The Connelly IRON SPONGE purification process at the well site removes hydrogen sulphide BEFORE the gas is piped to central processing. Thus, the cause of pipe line corrosion is eliminated because corrosive gas never enters the transmission lines. Additionally, Connelly IRON SPONGE eliminates the need for extreme close control. It operates with high efficiency at low or high pressures—absorbs more H_2S, gives longer service between foulings and is easily regenerated. If you have a purification problem check this MOST ECONOMICAL solution today. Write for Field Processing Bulletin #OG-7.

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Elizabeth, New Jersey

people • *Continued*

HOVE is chief engineer, and W. R. HOWARD is secretary.

RICHARD B. JOHNSON has been appointed system training director for Consolidated Natural Gas Co., Pittsburgh.

F. P. HYER has been elected to the board of directors of Delaware Power & Light Co., Wilmington. He succeeds the late J. Wallace Woodford. Mr. Hyer, vice president in charge of engineering, operations and construction, joined the company in 1947 as supervisor of operations.

T. L. SHARKEY has been appointed assistant manager of the rate department of Ebasco Service Inc., New York.

WILLIAM D. KOHLINS is general manager of Blaw-Knox Co.'s Buflovak Equipment Division, Buffalo, N. Y. He has been serving as division manager since 1956.

The following officers were elected by the board of directors of Florence Stove Co.: HAROLD M. JESKE, executive vice president; L. R. JENSEN, vice president, production; E. A. TOOLIS, controller and assistant treasurer; W. E. MCTAGUE, secretary; and W. C. WAGGONER JR., vice president and treasurer.

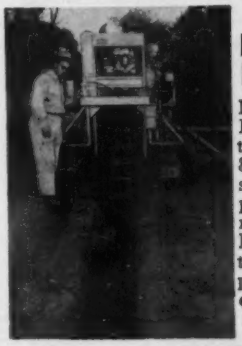
JOHN H. EISEMAN, who recently retired after 37 years with the National Bureau of Standards, has been appointed consultant to the Metalbestos Division, William Wallace Co., Belmont, Calif. In 1957 Mr. Eiseman won the gas industry's Distinguished Service Award. The Metalbestos Division also has appointed CHARLES Q. GIFFIN southern California district manager and JAMES O. KYLE northern California district manager.

DONALD K. BAARSON has been elected treasurer of Cascade Natural Gas Corp., Seattle. He succeeds O. Marshall Jones, who recently became president.

Several appointments have been announced by Barton Instrument Corp., Monterey Park, Calif. Raised to the post of vice president in charge of product engineering and development is CLAUDE B. NOLTE, who since 1946 has served as vice president, sales manager and vice

3 FAST RUGGED LOW COST Pow-R-Ditchers

A Model For Nearly Every Need

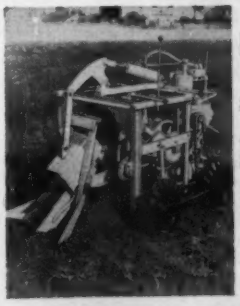


Model 524T Pow-R-Ditcher

Lowest priced BIG ditcher on the market! Digs 8"-24" wide at speeds of 1'-15' per minute. One man operation. Ideal for contractors, municipalities, utilities, etc.

Model 4T Pow-R-Ditcher

The Vermeer "Midget Ditcher" digs 6"-14" wide and is only 6' high, 13' long, 48" wide. Easily transported on a pick-up truck. Very maneuverable and ideal for footings, cable, gas, water and sewage lines.



Model W-2 Pow-R-Ditcher

Smallest of the Pow-R-Ditchers, the W-2 digs 2½"-4" wide and 3' deep. For gas service, electrical service and shallow water lines.

Write For Literature and Low Prices on the Complete Vermeer Pow-R-Ditcher Line

Thousands of Pow-R-Ditchers used from coast to coast. Learn what low ditcher prices really mean! Write for name of nearest dealer.

VERMEER MANUFACTURING CO.

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president in charge of production. WILLIAM S. CHRISTIAN has been promoted to sales manager. He has been with the company since 1949. And, EVERETTE M. FURR, who has been production planning supervisor for the past six years, is now factory superintendent.

Three top executives of the Dayton (Ohio) Power & Light Co. have moved up a notch. FRANK M. TAIT was named honorary chairman of the board, KENNETH C. LONG became chairman of the board, and JAMES M. STUART was named president and general manager.

CARL T. CURTIS has been promoted to vice president, Aurora plant manager, by Barber-Greene Co., Aurora, Ill. Other promotions are: FRANK J. MERRILL to vice president, DeKalb plant manager, and W. ALEX GREEN, manufacturing coordinator. Barber-Greene also named JOHN L. ROOT as chief, ditcher sales.

L. W. MACNAUGHTON, board chairman for the consulting firm of DeGolyer & MacNaughton, has been elected to Dresser Industries board of directors.

RAYMOND E. ORTON has joined Cleveland (Ohio) Trencher Co. as assistant general manager. Prior to his recent appointment, Mr. Orton was manager of engineering in the Automatic Transportation division of Yale & Towne Manufacturing Co.

DANIEL L. MCGUINESS JR. has joined Proportioneers Inc., a division of B-I-F Industries Inc., as development coordinator. He will be responsible for overseeing all development activities of the division.

WILLIAM O. BROWN, manager of Crane Co.'s West Coast sales district, has been appointed general manager of sales with headquarters at the company's general offices in Chicago. Mr. Brown joined Crane in 1930 at its Washington, D. C. branch.

SAMUEL F. SHAWHAN has been elected president of Bryant Manufacturing Co., Indianapolis, Ind., division of Carrier Corp. He succeeds RONALD N. CAMPBELL, who has resigned. Mr. Shawhan has been with Carrier since 1925, as assistant to the president since 1955. ROY C. EAST is now advertising man-

Continued on page 118

Engineering PLUS . . . makes the difference in pipeline cathodic protection

E. R. P. corrosion engineers check an exposed leak area. Here they correlate pipe potential and line current measurements for electrolysis.

It takes a lot of know-how to protect a pipeline from corrosion. That's why corrosion engineers at E.R.P. keep abreast of the latest instrumentation. Whether they are protecting an old pipeline or preventing corrosion on a new line, they use every modern method to be sure each cathodic system is as effective as possible.

That's what makes the difference in E.R.P. cathodic protection: engineering when the cathodic system is designed; when it's installed; when periodic corrosion surveys are made to check for environmental changes.

If you are looking for pipeline protection, E.R.P. is ready to serve you. For full information write for Bulletin E-47.00.

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CABLE: ELECTRO, NEWARK, N. J.

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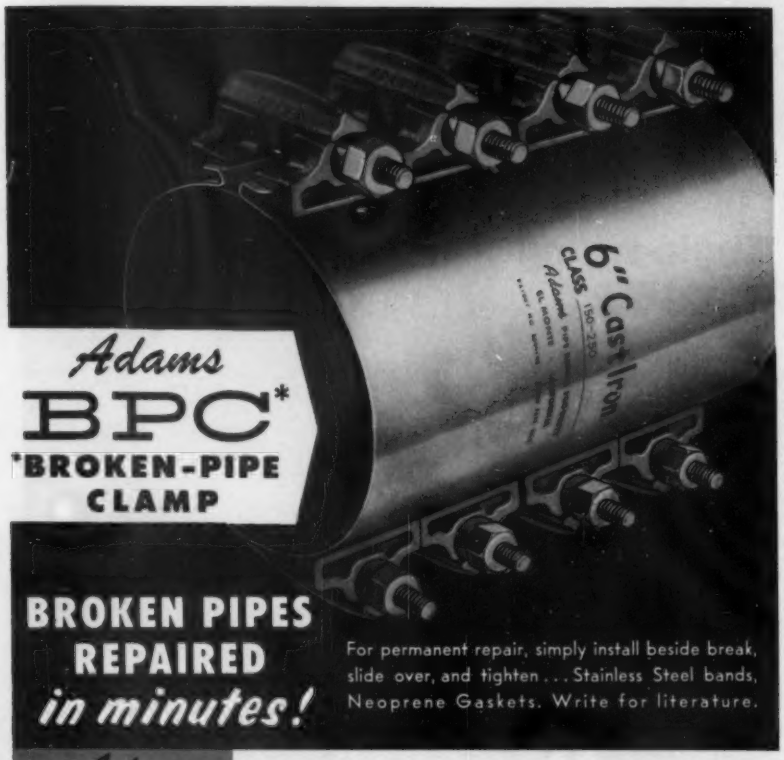

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use **TiteSeal**®

SEALING COMPOUNDS

Heat and vibration-proof, non-solvent, will not shrink, crack or crumble. Makes all assemblies leak-proof and pressure-tight. Prevents rust, corrosion, joint seizure.

7 BASIC BLENDS

LIQUID WRENCH®
The super-penetrating rust solvent

LOOSENS rusted bolts, nuts, screws, 'frozen' parts

Liquid Wrench works *fast*...yet is absolutely safe for all metals and alloys.

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ORDER ONE
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SURE LOCATIONS EVERY TIME!

- **NO WIRES, BATTERIES or SWITCHES**—simple, powerful magnetic action, factory adjusted to YOUR geographical location assures unfailing results!
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ORDER NOW — Wire or call Kirby 1-4200 collect for fastest delivery!

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2016 Leslie Ave., Cincinnati 12, Ohio

GAS CALENDAR

April

8- 9..5th Gas Compressor Institute—Randall's Cafeteria, Liberal, Kan.

8-10..AGA Sales Conference on Industrial & Commercial Gas—Hotel Schroeder, Milwaukee.

11..Southeastern Gas Association Gas Transmission Conference — Selwyn Hotel, Charlotte, N. C.

14-16..National Conference of Electric & Gas Utility Accountants — Shamrock-Hilton Hotel, Houston.

15-17..Southwestern Gas Measurement Short Course—University of Oklahoma, North Campus, Norman.

17-18..Indiana Gas Association Annual Meeting — French Lick-Sheraton Hotel, French Lick, Ind.

21-23 AGA Research and Utilization Conference — Hotel Carter, Cleveland, Ohio.

25..Southeastern Gas Association Gas Accounting, Purchasing and Stores Conference—Selwyn Hotel, Charlotte, N. C.

28-30..Southern Gas Association Annual Convention—Dallas.

29-30..PCGA Technical Section Distribution Conference—Tucson, Ariz.

29-May 1..Petroleum Industry Electrical Association Annual Meeting and Exhibit — Baker and Adolphus Hotels, Dallas.

May

5- 9..AGA Distribution, Production, and Transmission Conference—Roosevelt and Commodore Hotels, New York.

5- 9..AGA Commercial Gas School, Industrial & Commercial Gas Section—Edgewater Beach Hotel, Chicago.

6- 7..PCGA Technical Section Transmission Conference—San Diego, Calif.

8- 9..Annual Convention Public Utilities Advertising Association—Penn Sheraton Hotel, Pittsburgh.

9..Southeastern Gas Association Gas Sales Conference—Selwyn Hotel, Charlotte, N. C.

Week of May 12..PCGA Sales Section Industrial Gas School—Los Angeles.

12-13..AGA Eastern Gas Sales Conference, Residential Section — Park Sheraton Hotel, New York.

12-19. AGA Mid West Regional Gas Sales Conference — Edgewater Beach Hotel, Chicago.

15. NEGA Operating Division — Sheraton-Biltmore Hotel, Providence, R. I.

15-16. Midwest Industrial Gas Council —Joliet, Ill.

19-21. AGA-Mid-West Regional Gas Sales Conference — Edgewater Beach Hotel, Chicago.

19-23. National Fire Protection Association Annual Meeting—Palmer House, Chicago.

20-21. PCGA Technical Section Customer Service Conference — Olympic Hotel, Seattle, Wash.

20-22. Pennsylvania Gas Association Annual Meeting—Pocono Manor Inn, Pocono Manor, Pa.

22-23. Natural Gas & Petroleum Association of Canada Annual Meeting—Windsor, Ont.

23. Southeastern Gas Association Gas Distribution Conference — Selwyn Hotel, Charlotte, N. C.

June

3- 4. AGA-PCGA Joint Domestic Gas Research & Utilization Conference—Ambassador Hotel, Los Angeles.

4. NEGA Operating Division — Sheraton-Biltmore Hotel, Providence.

5- 6. NEGA Sales Managers and Supervisors Workshop — Toytown Tavern, Winchendon, Mass.

10-12. 3rd Annual Appalachian Underground Corrosion Short Course—West Virginia University, Morgantown, W. Va.

11-13. Gas Measurement School—Worcester Polytechnic Institute, Worcester, Mass.

15-19. American Society of Mechanical Engineers—Hotel Statler, Detroit.

23-24. Michigan Gas Association — Grand Hotel, Mackinac Island Mich.

24-27. Canadian Gas Association Annual Meeting—Manoir Richelieu Hotel, Murray Bay, Quebec.

September

2- 4. Pacific Coast Gas Association Annual Convention—Multnomah Hotel, Portland, Oregon.

5. New Jersey Gas Association Annual Meeting—Spring Lake, N. J.

17-19. Southeastern Gas Association Annual Meeting—Sir Walter Hotel, Raleigh, N. C.

22-25. 7th International Gas Conference—Rome, Italy.

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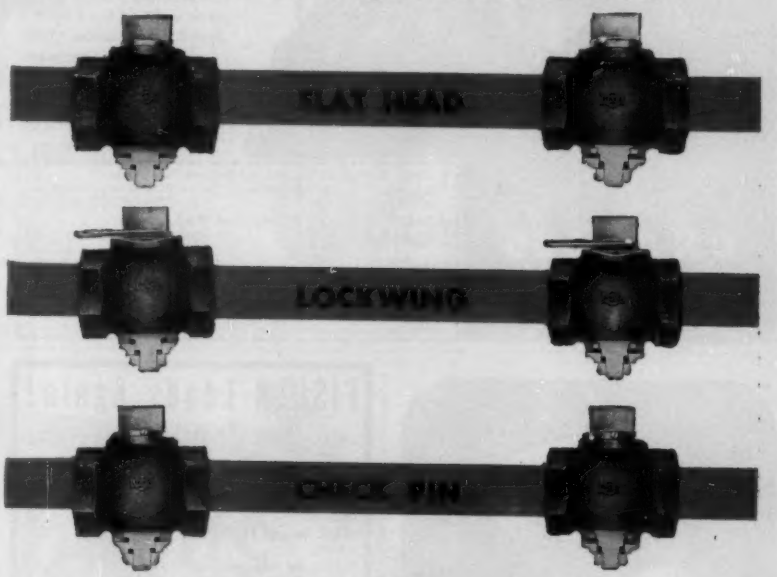
REGULAR PATTERN

Full Range of Sizes

"KEY-LOK" TAMPER PROOF

Iron Body with Brass Plug ... Black or Galvanized



Quality Assured — By Precision Machining ... Individual Testing ... Rigid Inspection

Quality Proven by Supplying the Gas Industry for Over 80 Years

Hays also manufactures a full line of all brass stops

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Another Hays First

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GAS SERVICE PRODUCTS

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Service-Line Trench for Less . . . Minimum Turf Damage!

CHARLES' SELF-PROPELLED MODEL M-2 DITCH WITCH TRENCHER

PRODUCES TRENCH AT LOWEST COST Guaranteed...

. . . less than any other machine or method!

Model M-2 Illustrated

Now—dig narrow trench—3", 4½" or 6", straight as an arrow, with spoils neatly deposited on one side, and with minimum damage to the turf. We guarantee Ditch Witch to produce trench at the lowest possible cost, usually about 2c a foot. Check the M-2 features: Self-Propelled • 3 mph Mobility • Digs 6 fpm, up to 4' Deep • 9.2 hp • 3-Speed Transmission • One-Man Operation!

TRY a Ditch Witch and You'll BUY a Ditch Witch! Ask about Trial Purchase.

Charles Machine Works, Inc., 626 B Street, Perry, Okla.
Send me, without obligation on my part, additional information on the following:

☐ M-2 Ditch Witch ☐ Other Ditch Witch Trenchers
☐ Trial Purchase Plan

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City....., State.....

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WARRENGAS the Convertible Fuel

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PETROLEUM CORPORATION
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New Transistorized Pipe Finder!

FIRST to build pipe finders;
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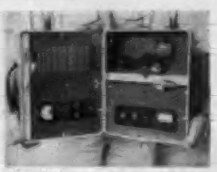
FIRST to use single-turn, solid-metal loops —announces the world's newest transistorized pipe-cable finder.

Here's what exclusive Fisher transistorized design means to you:

- Greater depth penetration
- Pinpoint accuracy
- Extraordinary battery life—one year between battery changes
- Built-in battery testers
- 90% less maintenance costs
- No tubes



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FREE 10 DAY TRIAL OFFER

people • *Continued*

from page 115

ager of Bryant. He joined the company in 1955 as assistant ad manager.

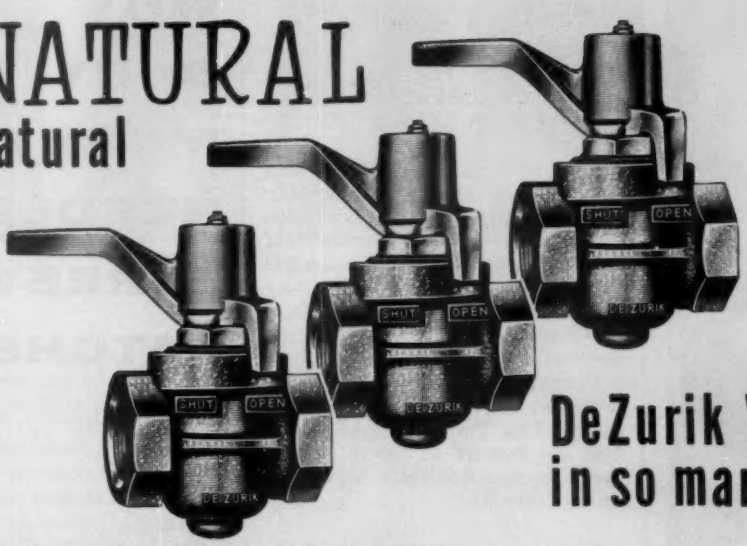
Three new board members have been elected by Schield-Bantam Co., Waverly, Iowa. They are JAMES H. BOYD, vice president, production, Fisher Governor Co.; ROBERT J. CROSSLEY, vice president of the First National Bank of Chicago; and MERLE A. MILLER, vice president and treasurer of the Joseph T. Ryerson & Son Inc. Steel Co. of Chicago. At the same time, the board separated the responsibilities of chairman of the board and president. VERN SCHIELD retains the office of chairman and WILBUR L. SCHIELD was elected president of the company.

PHILIP E. W. GOODWIN JR. has been named general manager of Rockwell Manufacturing Co.'s new plant at Kearney, Neb. For the past five years he has been general manager of the Sulphur Springs, Texas valve plant.

DAVID D. ACKERMAN has been elected president and a director of Ludlow Valve Manufacturing Co. Inc., Troy, N. Y., and its Canadian subsidiary. He succeeds EARL W. PUGHE, who has retired. Mr. Ackerman has been with Ludlow since 1947. In January 1957 he was made assistant to the president and in July of that year became vice president and general manager.

Several appointments have been made by Roots-Connersville Blower Division of Dresser Industries Inc., Connersville, Ind. RICHARD L. TANNEHILL is now district manager of the New York sales office. Manager of the Cleveland district since 1954, Mr. Tannehill will supervise sales in eastern New York, Connecticut, northern New Jersey and northeastern Pennsylvania. He has been with the company since 1947. DONALD L. DOWLING, formerly New York district manager, moves up to the post of engineering consultant. He will give sales and engineering assistance to the company's eastern offices. Mr. Dowling has been with Roots-Connersville since 1925, and for the past 26 years has been head of the New York sales office. WESLEY W. WRIGHT has succeeded Mr. Tannehill as district manager of the Cleveland sales office. He will supervise sales in Ohio, Indiana.

A NATURAL for natural gas!



DeZurik Valves excel in so many ways....

WITH QUARTER-TURN OPERATION . . .
THEY SHUT TIGHT . . . WITHOUT LUBRICATION!
THEY OPEN EASILY . . . WITHOUT FRICTION!

In sizes 1/2" thru 20" with a full complement of operators. Representatives in all principal cities, or write for details.

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Build profits with PHILCO-BENDIX GAS LAUNDRY

Philco-Bendix Gas Dryer sales are up 264%! More Philco-Bendix Gas Duomatic washer-dryers have been sold than competition combined! Now, discover how you can profit from this huge sales success. Learn how Philco quality lets you sell the most trouble-free gas laundry on the market. Find out how Philco's crack sales and service team can help you organize the most forceful merchandising programs in gas laundry. All you have to do is send the coupon. Don't wait!

Mail the coupon today!

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O.K. Tell me about the terrific merchandising and sales opportunities with Philco-Bendix gas laundry. I understand there is no obligation.

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Philco-Bendix Home Laundry Appliances are brought to you by Philco Corporation

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...and a stock item

.0035 of an inch in thickness! . . . AND UP. . . with sensitivity, strength, long life for continuous accurate regulation and registration. Vulcan diaphragms—quality controlled from raw material to finished product—are the accepted standard proved by use from city gate to home and factory. They're adaptable—equally efficient with L. P. natural, manufactured gas or combinations.

Another

REEVES VULCAN
RUBBER PRODUCT

Diaphragms for regulators, meters, instruments and controls.

Coverlight, neoprene coated nylon for protective coverings.

REEVES BROTHERS INC.
Vulcan Rubber Products Div.
54 Worth Street, N.Y. 13, N.Y.

people • *Continued*

and Kentucky. For the past five years Mr. Wright has been a field engineer in the New York office.

EDWARD F. SIBLEY has been elevated to the post of supervising administrative engineer in Pacific Gas & Electric Co.'s department of gas operations. Formerly senior gas distribution engineer, Mr. Sibley has been with the San Francisco-based company 21 years.

ROBERT E. LAKE has been elected president of Whirlpool Appliances Canada Ltd., Toronto. Serving with him are ROBERT P. LEWIS as vice president and ROY ERIKSON as secretary-treasurer.

WILLIAM H. SHENKLE, chief engineer of Rockwell Manufacturing Co.'s Instrument Division at Tulsa, has been promoted to general manager. Mr. Shenkle joined Rockwell in 1953 as a product engineer at the Tulsa operation.

GEORGE H. GIESLER is now a sales representative of the Fulton Sylphon Division, Robertshaw-Fulton Controls Co. He will handle sales in Nashville, Knoxville, Chattanooga and portions of lower Kentucky and western North Carolina.

Outstanding in communities — That's the designation for M. E. Vernon (left) and G. E. Laver (right), both with Ohio Fuel Gas Co. Each was named Junior Chamber of Commerce "Young Man of the Year" in their respective communities. H. C. Taylor, Elyria district manager admires plaques awarded the two men. Mr. Laver is business promotion representative for Ohio Fuel in Elyria while Mr. Vernon is Lorain division accounting supervisor.

WHY BURY MONEY IN NEEDLESS STREET PATCHES?

GREENLEE Hydraulic Pipe Pushers like the one shown below quickly install pipe under streets with a minimum of ditching and backfilling and *no damage to roadbeds or pavement!* A GREENLEE Pipe Pusher cuts job time and costs to a fraction. Can pay for itself on the first job — *usually* does on the first *few* jobs. Model shown pushes 3/4" to 4" pipe about 2 ft per minute with power pump. Larger unit available for larger pipe and concrete sewers. Instead of another useless street repair job, invest the same money in a valuable time-saving, worksaving GREENLEE Pipe Pusher! Write today for free literature.

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Joseph Frates
Ridge Tool

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Washington Nat.

Donald Hackett
Dresser

ROY A. DOMAN has been promoted to manager of engineering by New York State Natural Gas Corp., Pittsburgh. Mr. Doman has been chief engineer since 1956. He joined New York Natural in 1951 as chief civil engineer. The company also has named DONALD L. BARGER superintendent of operations. He has been superintendent, production and transmission, since 1955. JOHN E. STUCHELL is now assistant to the superintendent of operations and WILLIAM D. BUCHANAN has been named to head a newly formed eastern division, headquartering at Utica, N. Y.

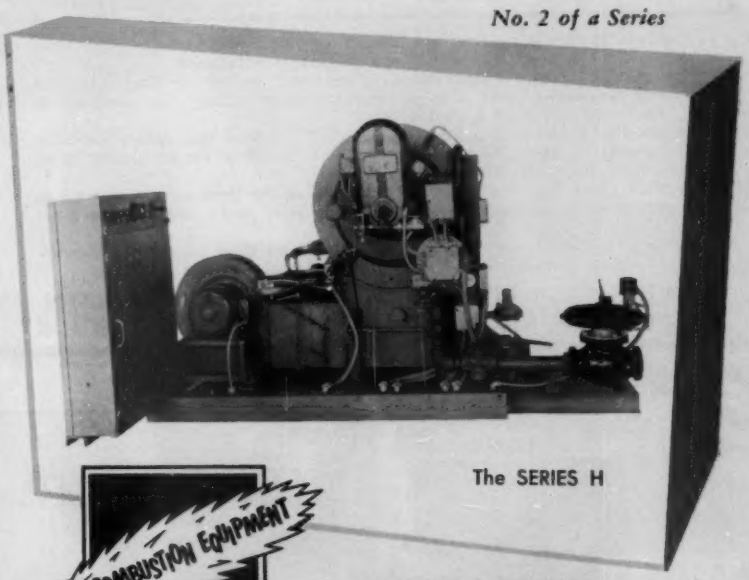
CARL H. INGWER, founder and president of the Ridge Tool Co., Elyria, Ohio, was made chairman of the board. He is succeeded as president by JOSEPH A. FRATES, who also becomes general manager.

Several promotions have been announced by Dresser Manufacturing Division, Dresser Industries Inc. DONALD V. HACKETT is now gas market manager for the Bradford, Pa. company. The former district manager-gas for Dresser will manage sales of Dresser piping products to the gas industry. The company's newly organized product engineering department has two new engineering managers. JOHN T. DUNTON is in charge of pipe joining products and service fittings and HOWARD HOKE is in charge of pipe repair products. THOMAS O'HARGAN is the newly named customer service engineer.

Several appointments have been made by Peoples Natural Gas Co., Pittsburgh. PAUL FINK, with the company since 1951, is now chief mechanical engineer. ROBERT C. SWAGLER has been promoted to western division manager. LLOYD W. HAUGHT succeeds him as manager of the Glenshaw service area. MORGAN E. KRONK has joined Peoples Natural as chief draftsman.

ROBERT L. BEARDSLEY has been promoted to industrial and commercial sales manager for Washington Natural Gas Co., Seattle.

No. 2 of a Series



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ENGINEERED By THE WEBSTER ENGINEERING COMPANY

PACKAGED COMBUSTION by Webster

Gas, Oil or Combination Packaged Forced Draft Burner for either conventional or pressure firing of scotch marine boilers. Special assemblies and larger sizes available for water tube boilers. Flame retention gas ring insures stable operation over full range.

13 standard sizes from 60 to 500 horsepower.

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The **WEBSTER ENGINEERING** *Company*

TULSA 16, OKLAHOMA

Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

Reach a new HIGH in unit heater sales!

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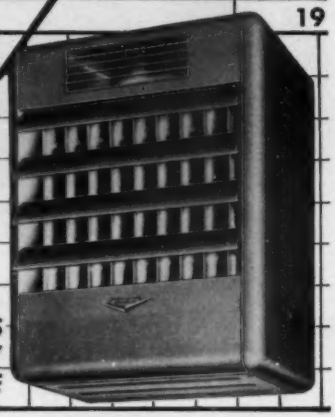
WITH Peerless GAS FIRED UNIT HEATERS

THE HEATERS MOST FREQUENTLY ASKED FOR BY NAME



The best in Automatic low cost heating for stores—restaurants—factories—shops . . . in fact any commercial or industrial heating need.

Peerless Unit Heaters have genuine customer appeal in their beautiful neutral gray-green color . . . modernistic cabinet styling . . . compactness . . . economy and quiet operation.

Combustion chamber is made of ALUMINIZED steel that resists corrosion and greatly increases the life of the unit. A choice of fan or blower in all sizes from 50,000 B.T.U. to 200,000 B.T.U.

Peerless gives your customers materially more for their money as well as greater heating satisfaction and best of all, more profit and less headaches for you.

See your Distributor or write us for literature on these rugged and dependable Peerless Heaters that all smart dealers handle with pride.

PEERLESS MANUFACTURING DIVISION
OF DOVER CORPORATION—LOUISVILLE 1, KENTUCKY

Servall ALL-STEEL SERVICE BODIES

FOR ALL ½-, ¾-, and 1-TON TRUCKS

Each body electrically welded into one unit with bed reinforced. Sturdy and economical . . . weatherproof compartments with recessed paddle-handle door locks.

Write for literature on service bodies, line-construction bodies, side boxes, and King Winches.

KING WINCHES

A-11 King Winch on A-120 (4 x 4) International truck.

There's a front-mount King Winch designed to fit your specific needs . . . for ½-ton through 2½-ton trucks . . . pulling capacities of 8,000 to 19,000 lbs.

P.T.O.-driven King Winch on Willys Jeep FOR ALL WILLYS JEEPS, 4 WD TRUCKS AND 4 WD STATION WAGONS.

Power-take-off-driven King Winch models 130J and 131J for CJ-3B and older-model Jeeps, can be transferred to CJ-5 and CJ-6 Jeeps . . nothing extra needed.

King Winches for International trucks available through International dealers.

Koenig cabs and King Winches for Willys vehicles available through all Willys dealers.

Koenig IRON WORKS, INC.

WEST 12th and ELLA BLVD., HOUSTON 7, TEXAS

LP-Gas STAND-BY PLANTS

For Industrial Stand-By—Peak Load Shaving—Bulk Storage—Dispensing or General Utility Use

Whatever your requirements may be, you can purchase ALGAS equipment on an economical basis. Plants start with tanks of 1000 gallons capacity and range upward.

Packaged, self-contained fully automatic gas plants. Vaporizers—Vaporizer-Mixers—Mixers. Complete Engineering Service Available.

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AMERICAN LIQUID GAS CORPORATION

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people • *Continued*

Two new divisions have been formed by Koppers Co. Inc., Pittsburgh, replacing the company's former chemical division. Heading the newly formed plastics division is DAVID L. EYNON JR. as vice president and general manager. T. C. KEELING JR. has been named vice president and general manager of the newly formed chemicals and dyestuffs division.

ROBERT S. SMALL, Greenville, S. C. businessman, has been elected to the board of directors of Piedmont Natural Gas Co., Charleston, S. C. He succeeds the late Fred W. Symmes.

JOHN K. ELFSTROM has been promoted to advertising manager of Utility Appliance Corp. and Mission Appliance Corp., Los Angeles.

RAYMOND J. KENARD, JR. has joined the fluid processing division of Selas Corp., Dresher, Pa., as a sales representative in the company's Los Angeles sales district.

Deaths

JOSEPH P. MULVIHILL, manager of the insurance and claim department of Brooklyn Union Gas Co., died recently following a short illness. He was 64. Mr. Mulvihill had a long career with the gas company, starting at the old Flatbush Gas Works in 1914.

ETHAN ALLEN PEYSER, 60, director of Washington Natural Gas Co. and formerly president of Washington Gas & Electric Co., died recently. Mr. Peyser became president of Washington Gas & Electric in 1950. He served in that capacity until 1955 when that company merged with Seattle Gas Co. to form Washington Natural Gas Co. Mr. Peyser was a senior partner in the Seattle law firm of Peyser, Cartano, Botzer & Chapman.

H. K. GRIFFIN, 70, vice president of the Mississippi Valley Gas Co., died recently after a lengthy illness.

The R. W. STAFFORD CO.

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Peak Sharing and Standby Plants
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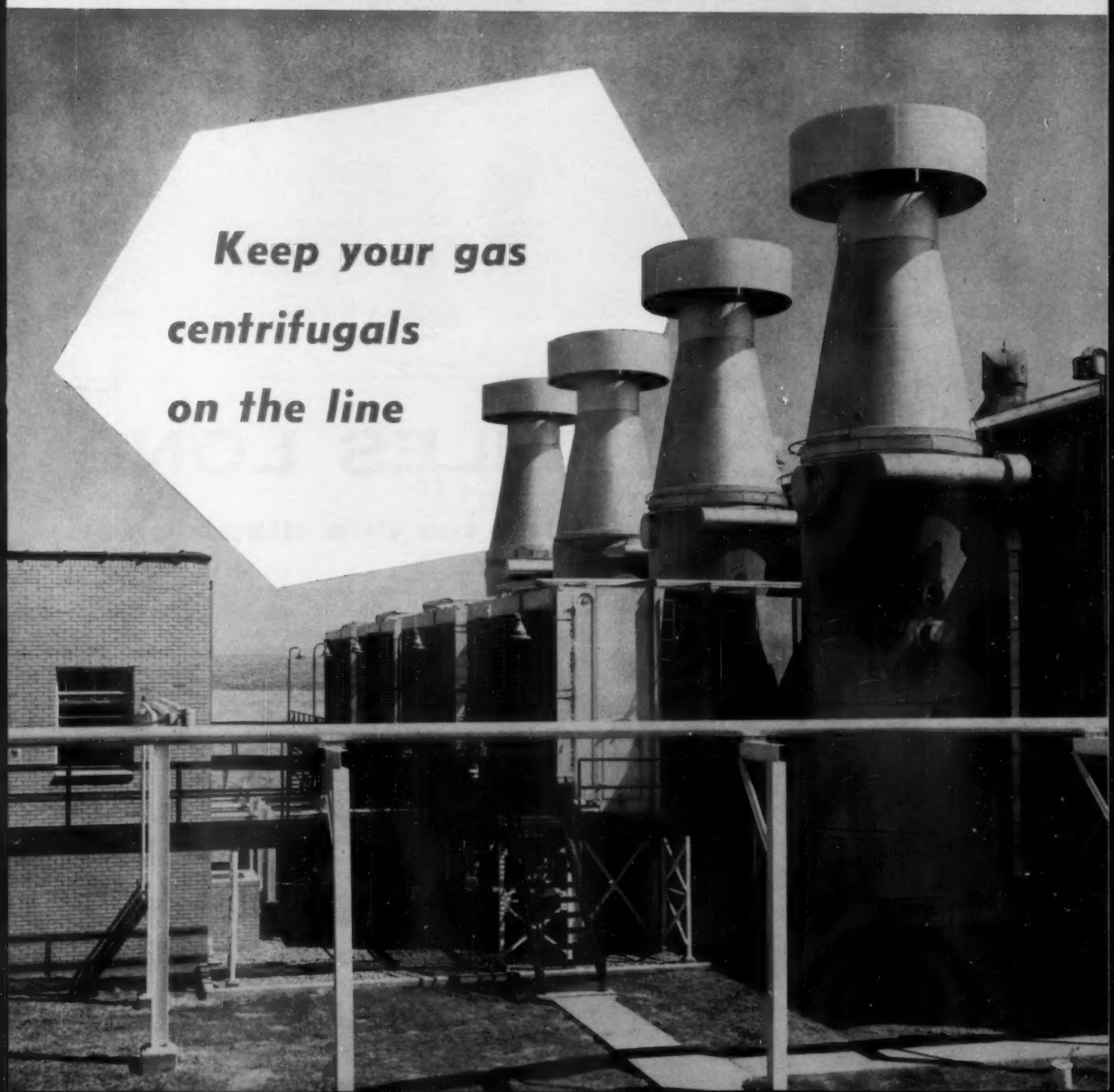
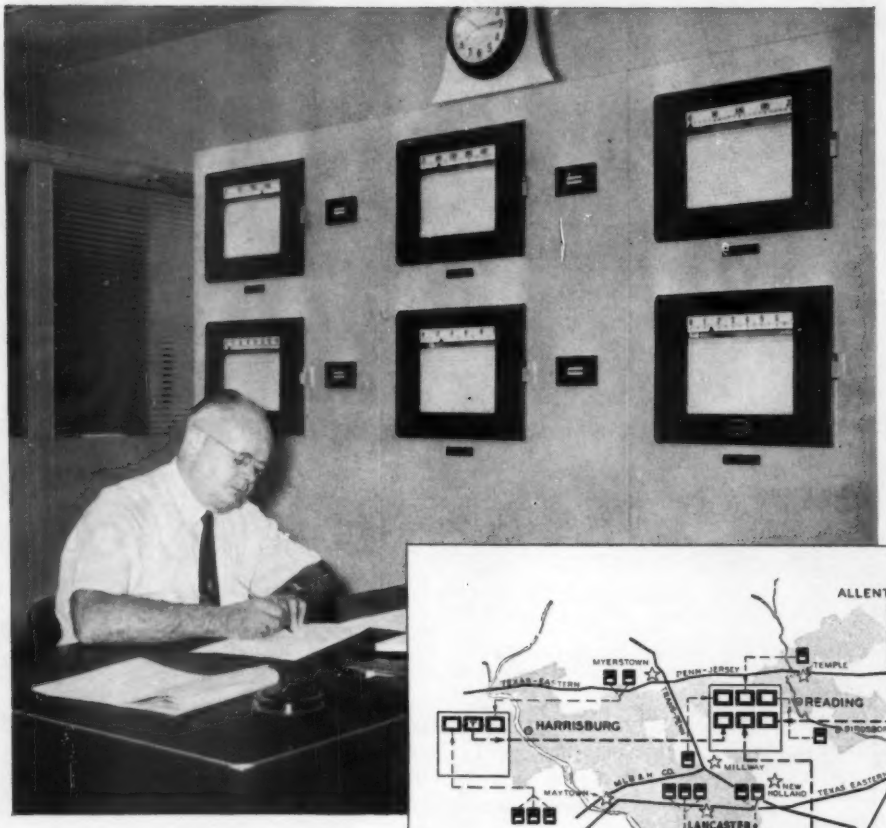
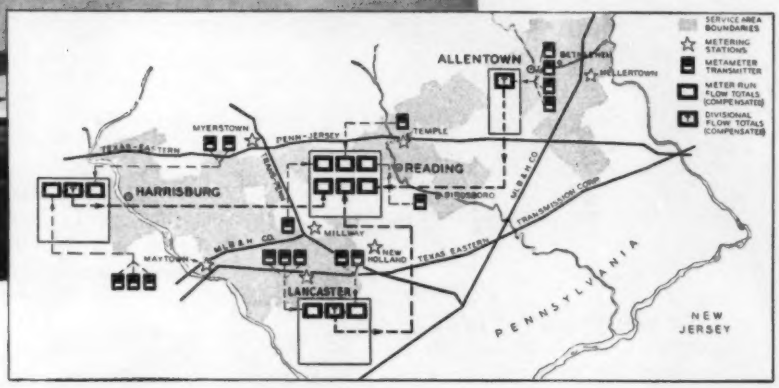
GAS

PIPELINE SECTION





THE BRISTOL METAMETER* computer at United Gas Improvement Company continuously monitors this gas distribution network, automatically totalizes and corrects flow, and transmits results to central dispatching office at Reading, Pa.
**T. M. Reg. U. S. Pat. Off.*



BRAIN 60 MILES LONG

computes for this dispatcher

Bristol computing telemeters give gas dispatcher instant, continuous, fully-corrected gas flow values

The instruments you see above are the readout end of a new Bristol computing telemeter system. They're installed at the Reading, Pa., headquarters of United Gas Improvement Company, whose natural gas distribution network serves the areas around Reading, Harrisburg, Lancaster, and Allentown, Pa. (See map.)

In seconds, the Bristol computing telemeters provide the gas dispatcher with integrated total flow values it used to take him hours to get—if at all. And the readings are fully and automatically corrected for factors like pressure, temperature, supercompressability and specific gravity. In fact, the continuously computed readings have generally agreed with the gas vendor's billing meter totals far more closely than the specified 1.5% accuracy.

Find out how a Bristol computing telemetering system can eliminate slide-rule work, information delays and uncertainties from your distribution system for natural gas or any other fluid, whether it covers miles or only a few hundred yards. Write: The Bristol Company, 119 Bristol Road, Waterbury 20, Conn.

BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

Keep your gas centrifugals

By F. VINTON LONG, Chief, Communications Section
Texas Eastern Transmission Corp., Shreveport, La.

MODERN gas centrifugal compressors are designed for maximum operating efficiency. To obtain this goal they must operate consistently somewhere near the critical "stall" or surge point of the compressor. This presents no trouble when all is well and the pipeline pack and flow can be held at optimum levels. Unfortunately this cannot always be done.

Sometimes it is not possible to feed one or more compressors at optimum flow. When this happens potential trouble begins to develop. In the past, procedure would probably be to take the compressors off the line rather than risk destructive surges that might occur. This method of operation is no longer always necessary.

To provide protection from destructive pressure and volume surges in gas lines, Surgetrol[1] surge detection and control devices are now being field tested in three 15,000-hp single-unit centrifugal compressor stations by a major gas pipeline company. Surgetrol can detect and in most instances institute corrective measures to counteract the problems of surges long before a compressor station operator can become aware of impending trouble.

Development of this device has made it apparent that it is often difficult for station operators to detect unstable operating conditions when their compressors enter the critical portion of their operating curve. In fact, first tests of the Surgetrol units in some stations caused worry that the device might be giving false indications of near surge, because the compressors appeared to be operating normally. Extensive tests proved that the Surgetrol was right, and the com-

GAS exclusive

[1] Trademark registered. Patent applied for.

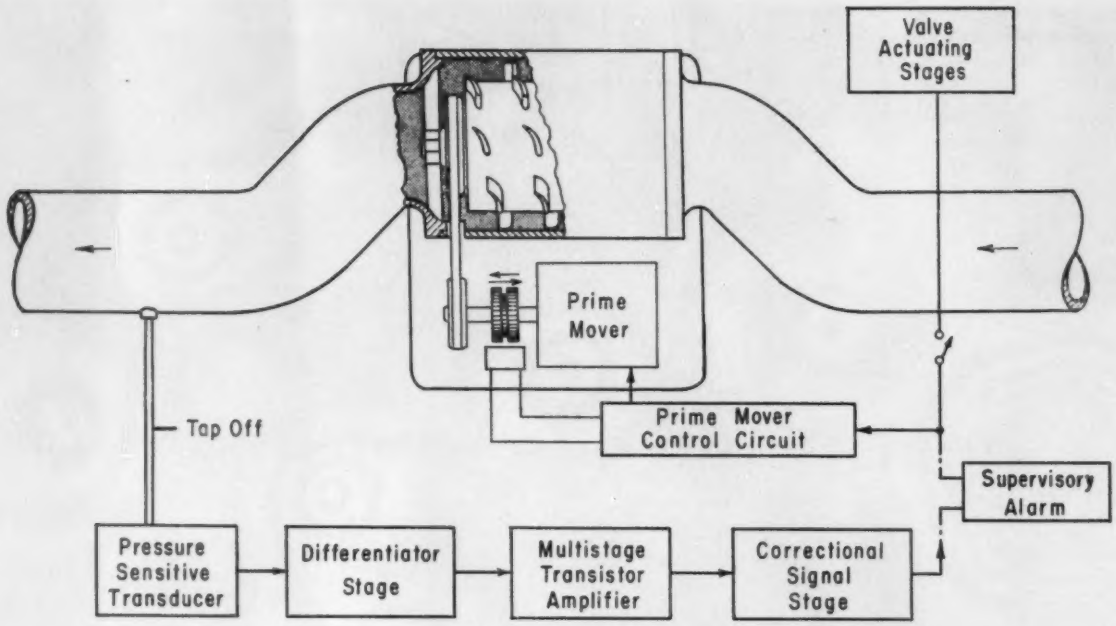


Fig. 1. Basic idea of Surgetrol operation.

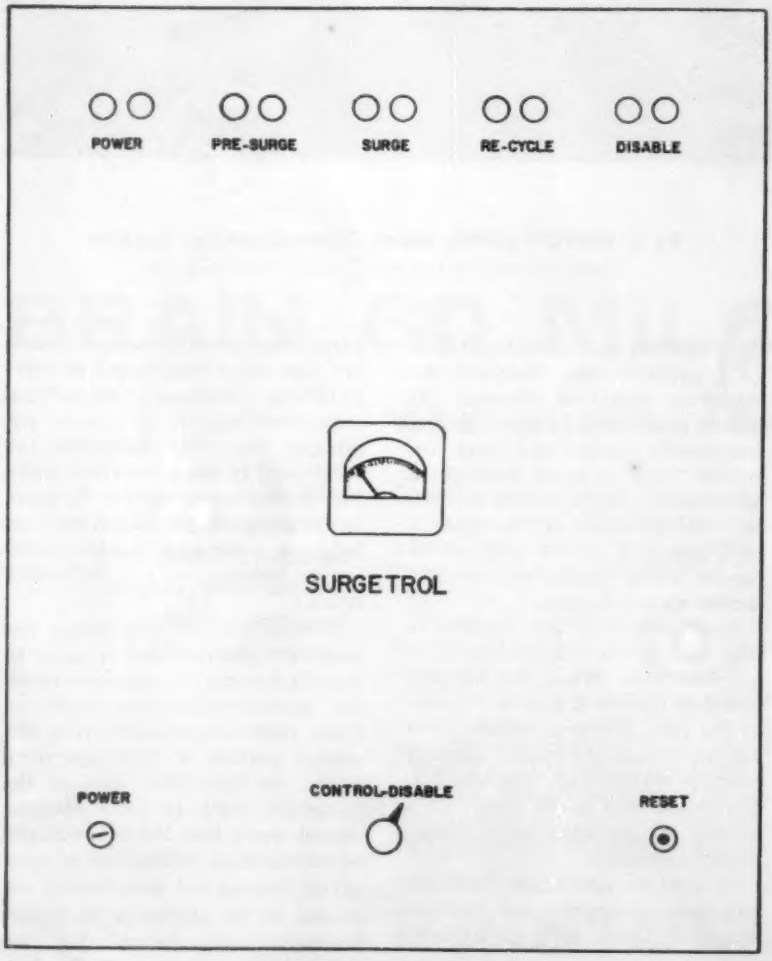


Fig. 2. Panel layout for Surgetrol.

pressors were operating near their critical speed for the flow involved, at that particular moment. Tests also proved that like airplane pilots, compressor station operators have to learn to trust their instruments.

Tests show that Surgetrol is of value in warning that the critical or "near surge" condition is present and action should be started before the surge actually occurs. However, if it should start to occur, the Surgetrol would immediately do one of several things, such as open a recycling valve, slow down a turbine, etc., as a counter measure in combating the increasing danger.

The ability of this equipment to forewarn of near surge conditions is an extra dividend which in some instances could make this function more valuable than the original operation of controlling surges.

Use of some type of warning device is a necessity for remotely controlled stations, and it is anticipated that the Surgetrol installation will involve use of dual units, connected to two transducers, which would provide the ultimate in safety plus "critical condition" warnings for manned and remote stations. If the operator is forewarned of a danger condition at his station, or if remotely controlled, the control operator will know the

true condition of the section of line under his control, he can take steps to improve line conditions if possible, and also be careful about dispatching pigs or doing other things which might trigger off a surge. However, the important thing is that with the aid of his surge control device he will be able to safely keep his station on the line.

The basic idea of Surgetrol operation is shown in *Fig. 1.* It is a true feedback device, with the amount of compressor control directly proportional to the condition of the discharge flow of gas. The controller can be connected to open a bypass or recycling valve until the surge condition ceases, at which point the opening movement ceases. Likewise the operating speed of a variable speed prime mover such as a reciprocating engine or turbine can be reduced until conditions improve.

Surgetrol is not a shutdown safety device such as an overload relay or a vibration switch. Its primary contribution is to keep the station on the line and to make necessary adjustments, where possible, to attain this goal.

In the case of an unattended station, the control operator, via telecontrol, can close the recycling valve if the Surgetrol has partially or fully opened it. In the event that surge should inadvertently start again while closing was in progress, the Surgetrol unit would take over control and reopen the valve sufficiently to stop the surge. If desired, this action could be fully automatic, although preference is for manual closing of the valve or increasing speed of the blower. If attention is emphasized on the pre-surge warning signal, actual surge can usually be prevented, and the stations can safely be kept on the line. This means increased revenue through a substantial reduction in station downtime.

Several lamps and alarms give indication both to the station attendant and to the remote operator if unattended operation is used, of several conditions:

1. *"Pre-surge or critical condition."* (Flashing amber lights which continue as long as the condition exists.)
2. *"Surge condition."* (Alarm bell plus red lights.) At this point the device operates to correct the surge.
3. *"Surge has occurred."* Warning purple lights which stay on and advise the operator that a surge has occurred and that the device has acted. This has a reset push button.
4. *"Surgetrol disable warning."* Green pulsing lights, which advise that a local attendant has turned the "disable" switch to "off" in order to test the unit.
5. *"Surgetrol power on."* Continuous white lights which indicate the Surgetrol has operating power.

It will be noted that dual indicating lights are used, as a further safety precaution. The panel layout showing these indications is shown in *Fig. 2.* The operating panel is shown in *Fig. 3.*

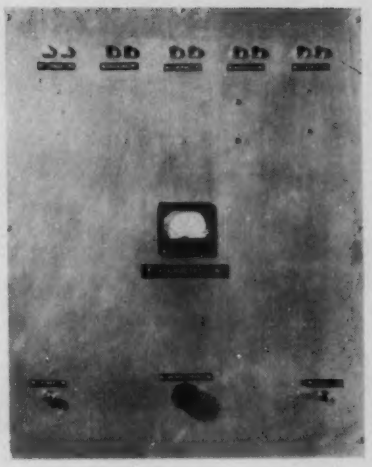


Fig. 3. Operating panel.

Operation of the Surgetrol device is quite simple. One or more pressure transducers are placed in the discharge side of the compressor line. Intelligence from the transducer is fed to the input of a very sensitive amplifier that uses transistors in place of vacuum tubes. The signal is amplified and integrated so that direct current pulses will be available at the output of the amplifier to provide warning and control signals.

It will be noted that only an indication of pressure change and not ambient pressure value is required of the transducer. Additional circuitry in the device will provide a flashing light if short transients occur which indicate an unstable condition, and further relay circuits will provide positive surge control operation, when required. Each Surgetrol installation is engineered to the type station to be protected. It is very important that surge characteristics of that particular type station match the design of certain portions of the Surgetrol in order to provide most efficient operation. Use of this device at remotely controlled stations is illustrated in *Fig. 4.*

One of the larger pipeline operation consulting firms about two years ago made the statement that everything was available for safe remote operation of gas centrifugal compressor stations except a surge control device. Although many improvements on this device will be surely made, it is now possible to say that this "missing link" seems well on the way as an established item for safe unattended compressor operation. ■

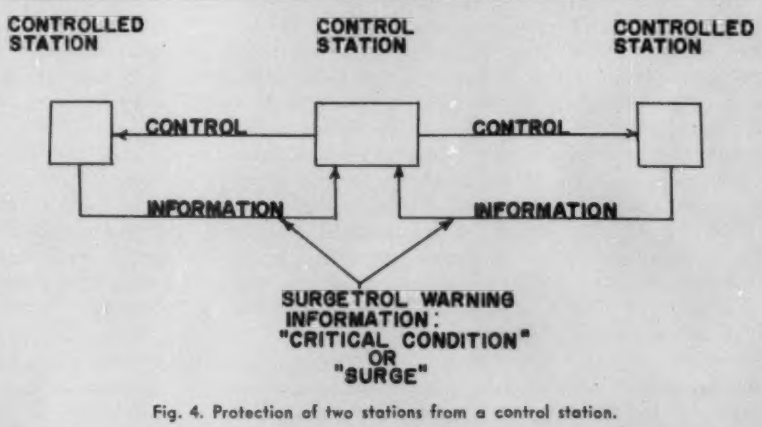


Fig. 4. Protection of two stations from a control station.

Claims and litigation resulting from . . .

Spread blasting and compressor station operation

By STRATTON HAMMON, President
Vibration Damage Specialists, Louisville, Ky.

THE problems of the transmission companies arising from construction of the lines, explosions in the compressor stations, and even from the normal operation of the compressor stations are increasing with surprising acceleration. While transmission line construction and the locations of the stations are generally in the sparsely settled sections of the country, they are, because of this, in the quiet sections of the country and the noise of blasting and the flutter of compressors is more attention arresting than they would be in the hustle and bustle of urban life. There are few masking noises to offset the audibility of whatever is done.

It is also true that in general a great deal more care must be taken in the preparation of a case which is to be tried before a rural jury than in litigation in which city dwellers compose the fact-finding body. The rural juries seem to let prejudices creep into their verdicts more often than do others. The exception to this is the mining communities where the intimate knowledge of the power and lack of power of explosions prevents the juries from giving credence to the fantastic tales presented by most plaintiffs in property damage claims.

Strangely enough it is the insurance companies that create the initial crack in the defense through which a flood of ruinous losses flow. Take a particular example of this suicidal tendency displayed many times by the insurance industry. There was an explosion near Cincinnati. The casualty company immediately called us in and we examined every one of 249 claims. Two located close to the explosion were actually damaged and the owners were promptly reimbursed. In all the others, located at considerable distances, the designated damages were found to have resulted from natural constructional deterioration, mostly due to age.

Upon receiving our reports the casualty company refused payment and the property owners then made claim upon their own fire and extended coverage carriers. Despite our negative findings and despite an utter lack of expert advice of their own, these fire companies, almost without exception, paid the claims. This is done under the belief that such abrogation of loss control is necessary to keep their policyholders happy. Considering the underwriting losses sustained by most companies this past year they would have done well to send this type of policyholder to their worst competitor instead of fighting for his favor.

After these fire insurance companies paid the claims the next thing they did was to seek a reimbursement of their overgenerous handout by subrogating against the casualty company. At this point any reasonable businessman who had right on his side, backed up by half a dozen varieties of technical proof, would have engaged some top legal talent and have defended vigorously in court. After winning several cases the balance would have died on the vine. However, things are not done this way among insurance people. Bargaining is begun and finally this situation was cleared up by the fire insurance companies paying one-third of the losses, the casualty company paying one-third, and the operator paying one-third. Everyone lost except the undamaged claimants.

Insurance companies take great pride in the shortsighted policy of judging each claim on its individual merits even though some of them came very near to going broke in 1957 clinging to this backward practice.

The "merit" of this particular "policy" was that each one of the triangle escaped with less loss than the cost of litigation. It was entirely overlooked that if the fire companies had not paid off on unfounded claims in the first place there would have been no litigation, at least between insurance companies. Instead the fire and casualty companies could have defended the few cases which reached court shoulder to shoulder and sharing the cost. The long view was completely ignored, the view that would have emphasized the extreme difficulty with claims which will meet the next pipeline laying spread which operated through this town or the next utility explosion which occurs. Once a community has learned the methods of obtaining easy money as a result of an explosion or operational noises, woe to the next outfit which gives them an excuse to file more claims. We have testified in trials in which the claimants were trying for the *third* payment on the same set of damages! The insurance company had freely paid the first two claims and fought only when the third demand was made. The insurance industry cannot seem to learn that if it teaches and encourages the public to make unfounded claims it is lighting a holocaust which will engulf it. Even after sustaining some $300 million of underwriting losses in 1957 their journals are full of pleas for higher premiums, almost nothing is said of putting an end to their tremendous give-away program.

The reason that the transmission companies are concerned in all this is that, in so far as they carry insurance, they will be called upon to reimburse the careless losses of the insurance industry by increased premiums. Even those large transmission companies which carry their own insurance are faced with the same temptations to compromise each individual claim as best they can and hope that they are not buying a ruinous future.

The following are three categories into which claims against transmission companies can be grouped:

• Dynamite blasting by pipeline laying spreads

As the spreads of the pipeline companies proceed across the country they must blast their way through the spreading fingers of the Appalachians, the sedimentary levels of limestone, or even the coral of Florida. Since this blasting is continuous and oftimes in close proximity to structures, claims are handled as a continuous obstacle to be directed into proper channels just as is the rock, earth and steel with which they must cope.

Each spread has its safety engineer whose job it is to process these claims. The claims come in every variety—wells and springs alleged to give less water than formerly, alleged contamination of wells, cracks in earth dams, cracks in dwellings, commercial buildings, bridges, ad infinitum. As a spread advances it leaves a wake of claims as a comet leaves a tail.

One such company has a deductible insurance arrangement whereby it pays the first few hundred dollars of each claim and the casualty carrier picks up from there. This lowers the premiums but puts the company in the insurance business. The safety engineer of the spread which had the best safety and claims record for 1956 informed me that he had paid out an average of $1300 per mile on claims. This did not include the sums paid out by his insurance company or the service costs of administering the claims.

In general the powder men of these spreads are very careful and allow no damaging vibrations to enter surrounding structures. Every so often, however, in the continuous push for speed the blasts will get out of hand and real damage will result. On one of these occasions I was with the safety engineer inspecting the side of a fine summer house which had been stove-in by the blasting of the pipeline company 500 ft away. When I asked what charge had been used he told me 350 lb of dynamite. I objected at once, and accused him of giving me false information, for the amount had to be in the neighborhood of 5000 lb to inflict such damage. He maintained that their blasting foreman had given him these figures and asked if there were any other possible sources of poundage information whereby he could check on their foreman. It was explained to him that the dray tickets on the dynamite hauled daily to the spread, divided by the number of detonations would give him a good rough figure. Several days later he called to say that my calculations had been correct and that the foreman had been discharged.

• Explosions in compressor stations

We received an emergency call informing us that there had been an explosion in a distant compressor station and were in the air and on our way before the fire was out. Upon arrival we found that a contractor had been in the process of installing a new compressor and enlarging the building to provide space for it. The work was just about completed when the explosion occurred, killing one man and damaging the building. The contractor's superintendent assumed all blame, saying that the sludge in the crank case of the unused compressor had exploded when the fatally injured man began welding a pipe nearby.

We mentioned that we would take a sample of the sludge the next morning for chemical analysis and our original misgivings were confirmed when, upon our return, we found the crank case drained, cleaned, and all possibility of securing a sample of the sludge gone forever. Thenceforth we worked under the premise that the contractor was wrongfully shouldering the blame to protect his good client. The transmission company was not a party to this misguided solicitousness and had a sincere desire to

learn the true facts so as to prevent similar future catastrophes.

Painstakingly we traced the contents of that huge crank case through its manufacturer to various chemical companies who had contributed their products to its contents and learned by this method that an explosion of this residue was impossible. It also turned out that the contractor was following precisely the instructions of an agent of the transmission company (the architect-engineer's specifications) in performing a welding operation inside an operating compressor station. Hence, the contractor was, against his will, entirely in the clear.

It was then necessary to trace the true origin of the explosive substance, presumed to be gas. By a process of elimination and the help of air-smoke tests we finally were able to reconstruct the events which led to the detonation. The 20-ft escape pipes were arranged in a row on one side of the building. Under certain winds and atmospheric conditions escaping gas was wafted back down to the ground and toward the building. On the day of the explosion all the basement windows were open and the gas entered here and was pulled by a draft up through the large hole in the floor, created by the installation of the new compressor, and out through the roof ventilators. The welding was attempted in the hole in the floor, directly in the most concentrated stream of the rising gas.

Proof of our findings lay in the fact that there were three separate explosions, one which shattered the basement windows, one high under the roof where the gas collected before passing through the ventilators, and one in the cavern-like crank case of the compressor where it had collected as it came through the hole in the floor. Measures were taken by the company to prevent a recurrence in any of their stations.

• Claims resulting from normal operation of compressor stations

This type of claim is extremely varied and ranges from rattling false teeth in a glass to drying up a well five miles away. Some have a true basis in fact as a personal nuisance, but most do not. Of the latter variety was the following case:

Shortly before a large pipeline was laid across Indiana a woman purchased a farm on which was located one 75-year-old dwelling and three dilapidated barns. The purchase price was $19,500. The pipeline right-of-way adjoined her property but did not cross it. During the construction of the line she collected $24,500 in supposed damages to her house which was located a quarter of a mile from the nearest blasting. Later inspection proved that the alleged damage was due to normal deterioration because of age and had actually occurred many years preceding the spread blasting.

After the construction had been brought to a close and a nearby compressor station put in operation the woman demanded an additional $38,000. Had she collected this amount she would have had a clear profit of $62,000 on her real estate venture and still had possession of her original holding! At this point the transmission company, which carried no insurance, lost patience and called us into the picture with instruction to spare no expense, but to win the suit which was certain to result from their intention to deny liability.

The plaintiff's plea set out that serious structural damage had occurred in the house and barns as a result of the vibrations, both earth and air borne, originating in the compressor station one-quarter mile distant. We made numerous tests with seismographs in the house, barns, surrounding houses, and even in the compressor station. None showed vibrations of a damaging character. The seismographs record vibrations down as low as .0005-in. displacement but could not find any strong enough to register in any of the buildings on the farm. As for the transmission of vibrations by air, we could barely register the sound with electronic equipment. It was just audible and in no way damaging to plaster, wood, and stone, or noticeable to humans.

Each separate item of claimed damage was painstakingly traced to its true source of poor construction, expansion and contraction, wood shrinkage, settlement, age, etc. We were also fortunate in being able to find several farmers who had, in the past, farmed this land as tenants and who remembered that the damage claimed to the barns had existed at that time. As is usual with such a well prepared case we sailed right through to a completely favorably verdict of the jury.

In the past half-qualified "experts" have been engaged much too often by the gas industry to represent them. When property damage is the principal issue, or a large part of the issue, it is essential that your specialist have a deep and extensive background in construction, that he be an architect and structural engineer as well as an explosive engineer, seismologist, and have extensive experience in the effects of concussion. It is also essential that he be an independent outsider.

Your own personnel, no matter how much they know, will have little weight in a courtroom since their testimony will be assumed to be prejudiced. Indeed they may even injure your case.

In the event of an explosion or even an operational claim, do not permit your own personnel to remove equipment for testing unless accompanied by a representative of the claimant, or at least have your independent specialist present. All sorts of dire motives will be attributed to the secret removal of equipment by opposing counsel. Even if the equipment tests perfectly no one will believe it in court if the testing was done in your own shops or laboratories with no one but your own employees present.

With proper damage specialists and good attorneys these claims can be successfully defended. No case in which we have been fully engaged and which has been taken to an appellate court has lost one penny for our clients. ■

(Part 2, which will discuss claims and litigation resulting from explosions in utility installations, will appear in the May issue of GAS.)

Pipeline, utilities team up to promote use of gas

ANYONE who travels around the southern part of New England these days, from Boston and vicinity down through Rhode Island and Connecticut, is bound to observe a continuing display of outdoor billboards proclaiming the superior benefits of "gas heat."

You can't miss these displays. The words "gas" or "gas heat" are emblazoned on each poster so boldly that there is no doubt about the identity of the product being advertised. Further, since you come in contact with the posters repeatedly the message on the boards inevitably registers in your mind.

These outdoor displays are highspotted in and around the service areas of 17 different gas companies. They are one element of an advertising program—regional in scope—which is sponsored by Algonquin Gas Transmission Co. with the cooperation of its New England customer companies.

The program was initiated by Algonquin early in 1956 and currently is in its third year of operation. Boston Gas Co., Brockton-Taunton Gas Co., Buzzards Bay Gas Co., Cambridge Gas Light Co., Connecticut Gas Co. (Division of Connecticut Light & Power Co.), gas properties of Hartford Electric Light Co. (New London Division), Fall River Gas Company, Hartford Gas Co. Narragansett Electric Co. (Warren-Bristol and Westerly divisions), New Bedford Gas & Edison Light Co., New Haven Gas Co., Newport Gas Light Co., North Attleboro Gas Co., City of Norwich Department of Public Utilities, Norwood Gas Co., Providence Gas Co., Worcester Gas Light Co. (Dedham-Hyde Park and Framingham divisions) . . . are the

Highway travelers in New England see billboards such as this in areas served by 17 distribution companies.

customer-companies of Algonquin which are participating in the activity.

How did this program get started and how was it sold to the participating companies? The answers to these questions, which may be of interest to other pipeline organizations and utility companies with contiguous service territories, are provided by George R. Copeland, president of Algonquin.

Prior to association with Algonquin, Mr. Copeland had a long background of experience in the sales and merchandising end of the gas industry. With such a background he is by nature alert to opportunities for effective sales promotion. "Our company," Mr. Copeland explained, "began its operations in the New England area in the fall of 1953. For the first two years all our energies were devoted to the problems of getting started and of supplying the most essential requirements of our customers.

"From the beginning, however, we had a realization that, to an important degree, our success would be associated with helping our customers to build up their gas load. We believed that one way in which this might be done would be through effective sales promotion and advertising on a cooperative basis.

"Early in the game we made two important basic decisions. Because the overall budget was not large, we decided to concentrate for the first year on one advertising medium. We also decided to concentrate at the start on one use of gas rather then scatter our shots. In the latter case we selected *gas heat* as the vehicle both because it is a load builder and because, with improved rate structures and increased sales effort, our New England customer companies have been striving to accelerate the growth of this business.

"Outdoor advertising was selected as our prime advertising medium for several reasons: First of all, we felt that it offered us, through frequency and repetition of the message, the greatest value under the circumstances for our advertising dollar. In addition, while most utility companies in our area are equipped to carry on local newspaper, direct mail and similar advertising, few of them have used the outdoor medium effectively. Perhaps the most compelling reason was that the use of outdoor allowed us to employ the same 'copy' simultaneously in 17 different market areas. In other words, with a coordinated program, regional in scope, a prospect out for a Sunday auto ride might and probably would see the same advertising message on 'gas heat' several times even though he might cross and re-cross the service areas of several different companies. Or, a traveler from Boston or Brockton or Fall River, for example, going to Providence or New London or New Haven would be exposed to an identical message on 'gas heat' any number of times along the way."

How was this cooperative program originally presented and sold to Algonquin's customer companies? "That posed some difficulties as it obviously would," Mr. Copeland stated. "However, without exception our customer companies in New England today are promotion minded, many of them vigorously so. Our cooperative proposal also represented a 'more for the money' incentive since Algonquin was footing the largest part of the bill and each participating company was obtaining the equivalent of $2 of advertising value for only $1 of investment. Another and perhaps the most appealing feature was the opportunity our proposal provided to participate at moderate cost in an integrated *regional* campaign covering a large part of a tri-state area with a population of around 4 million people and approximately 1 million gas meters."

Algonquin's outdoor advertising copy has stressed the basic themes of economy, cleanliness, dependability and modernity with such messages as: "It's Wise To Modernize, Economize,—with gas heat" and "Wake Up To Real Economy —Change To Modern Gas Heat." From time to time in the program the advertising has featured appeals to new home buyers and builders. One of these ads, illustrated by a drawing of a modern home, carried the message—"Build Right For The Future—With Modern Gas Heat."

The illustrations used have been such eye-catching devices as an alarm clock in the "Wake Up" ad and a snow-bound suburban home in an advertisement captioned, "End Stormy Weather Worries—Change to Dependable Gas Heat." The latter appeared on the boards during two of the winter months.

Throughout the program, every effort has been made, within limitations of the budget, to obtain high-quality layout and art treatment and to give the displays what outdoor advertising experts term a "national look." This is in con-

trast to the "local look" indicative of more parochial and less skillful art and copy technique.

In its program, Algonquin claims what is believed to be a "first" in the gas industry, namely the first use in advertising promotion of the fact that gas has gained the lead in home heating installations.

In New England markets, traditionally a stronghold of oil heating, this fact has had to be employed appropriately. The first of several Algonquin outdoor advertisements using this general theme appeared in January 1957. The display featured an outline map of the United States with the message "Coast To Coast — More Homes Now Use Gas Heat Than *Any* Other Fuel." A subsequent 1957 ad employed the same basic message in a varied key with the copy, "All Over The USA— More Homes Use Gas Heat Than *Any* Other Fuel." The first ad of the current season's outdoor campaign follows a kindred pattern. The illustration on the left side of the design shows a typical highway sign bearing the legend, "No. 1 Coast To Coast" while the rest of the panel features the basic "More Homes" message.

Commenting on the success of this theme, Algonquin officials say: "We have many reasons to believe that this piece of copy really started something. Not only our own customers but many other gas companies elsewhere have taken up this chant and have been using it in their own newspaper ads, window displays, radio commercials and direct mail. This has been all to the good, in our opinion, and we hope that even greater use will be made of the theme since the more circulation it obtains the better for all of us in the gas industry."

Algonquin and its customers have also been obtaining extra mileage from the outdoor advertising by reprinting the displays in 11-x-28-in. size, in full color, for use as window and counter displays, company truck posters, and street car and bus cards. Algonquin has provided the cards to companies at cost. When they are used as street car or bus displays the cost of space has been borne by the individual company.

The fine reception accorded to the advertising in 1956 encouraged Algonquin to expand the program in 1957 by adding to the number of billboards and also by the addition of spot radio commercials. As before, the campaign was established on a cooperative basis. The current 1958 campaign is running at approximately the same level with outdoor advertising at 115 different locations in various parts of Algonquin's service area and with approximately 5000 60-second radio announcements on "gas heat" broadcast on 20 different radio stations. The radio advertising is split into two 13-week cycles, the first beginning early in April and the second in mid-August for coordination with customer company spring and fall gas heating sales campaigns.

Algonquin selected spot radio as an additional advertising medium for reasons similar to those which dictated the choice of outdoor. It offered a substantial amount of repetition of the sales message for every dollar invested, and in various ways was believed to be the most effective method of intensifying the selling impact of the outdoor advertising. The radio commercials, accordingly, are deliberately built around the same basic copy themes as are used on the billboards.

In the 1958 program one new feature is being added, somewhat in the nature of an experiment. Previously the outdoor campaign has featured six different designs on "gas heat." Each of these designs is "up" for 60 days on the poster panels and for 90 days on the painted bulletins used in the Boston and Cambridge areas. This year two designs will feature "Modern Gas Cooking" at appropriate seasons of the year.

As to the program's overall success, Algonquin people state: "Our advertising has been promotional in character, tending chiefly to call attention to the superior merits and benefits of 'Gas Heat.' It has been planned not in any sense to replace local gas company advertising efforts but to support such efforts so that they will become more productive. Through the combination of outdoor and radio advertising we have kept promoting the use of 'gas' and 'gas heat' every day, 12 months of the year. It is, of course, impossible to measure exactly the fruits of this kind of promotion, but we have many convincing evidences that our advertising is being seen and heard and that it is effectively strengthening the local advertising and merchandising activities of our customer companies." ■

Algonquin took the lead in promoting campaigns featuring gas heat. Now both the pipeline and its utility customers are enthusiastic over the program.

Education for the gas industry at IGT

By REX T. ELLINGTON, Chairman, Education Program
Institute of Gas Technology, Chicago

THE current shortage of engineers and the great need for more technically trained men has been the subject of many discussions in recent years. Educators and management personnel have long been vitally concerned with this problem, and the federal government is now planning a scholarship program to encourage more young men to enter technical fields.

A number of industries have taken positive steps to help procure and train more capable young men. The gas industry has been notable among these; for more than 35 years it has been actively supporting engineering education at both the undergraduate and graduate levels. In one important effort, the Institute of Gas Technology, which is affiliated with the Illinois Institute of Technology, was established by the gas industry in 1941 to carry out basic research and education programs for the industry.

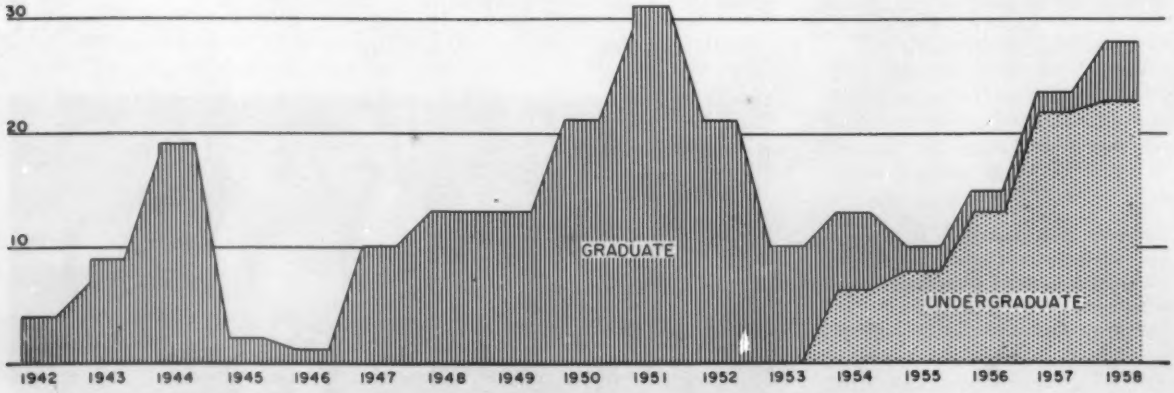
The education program at IGT has developed so that it now includes undergraduate and graduate training, summer technical sessions, and home study courses. Each program was developed to fill a specific need of the industry.

● Undergraduate program

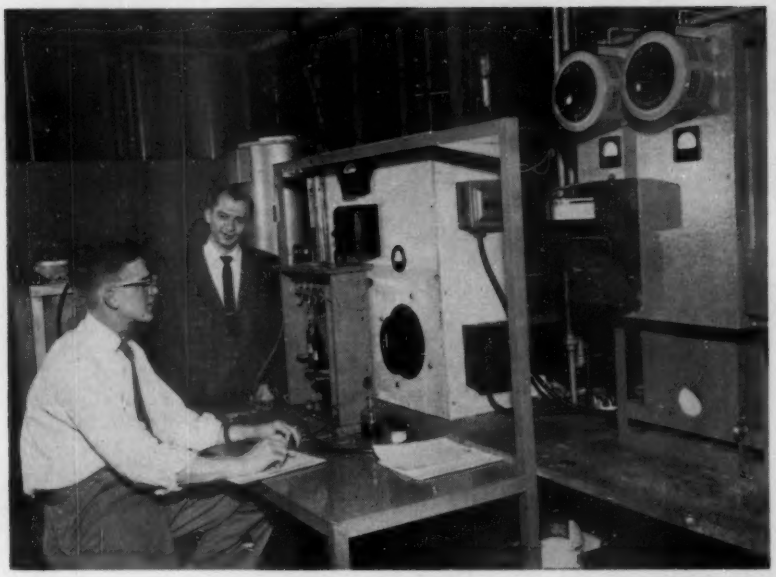
The undergraduate program is the object of current emphasis because of the great need by the industry for men trained at this level, and because it represents the best source of qualified graduate students. Impetus was also provided by the fact that nearly every engineering school teaches a power option in electrical engineering, but very few schools teach anything allied to gas engineering. The instruction in gas engineering at IGT acquaints the student with the fundamentals on which the gas industry's operations rest. When a man with such training enters the gas industry, on-the-job training is minimized and at the same time becomes much more effective because it supplements the trainee's firm basic knowledge with practical applications.

An important objective of the undergraduate program is, therefore, to give a group of well-qualified students introduction to each major phase of the industry's operations. If the student is attracted to the industry, he will have a foundation upon which to build a successful career. If he goes into another industry, he will have sound training, and opinions formed from contact with the most modern approach to the gas industry's problems. If he goes into research or education he will have a firm base for further study. A further benefit of the program is the development of material for eventual publication as reference texts for industry use.

It should be emphasized that, although the curriculum appears to



Growth of the IGT education program since the Institute's founding. In recent years, emphasis has been placed on undergraduate program.



Work-study program graduate student James E. Kennedy (left) works with equipment for his thesis study on reaction rates at hgh temperatures. With him is Dr. Rex T. Ellington, IGT education program chairman.

be specialized, fundamental science rather than operating technology is stressed in keeping with current education philosophy.

The direct training in the undergraduate program is carried out through a gas technology option in either chemical or mechanical engineering. The actual instruction consists, in addition to the usual engineering studies, of 12 semester hours of course work presented during the junior and senior years under the general titles of natural gas production and processing.

● Transmission, Distribution, Fuel Utilization

To achieve IGT's objectives, each course is organized to present the fundamentals of operations and processes important to the gas industry, and to deepen the penetration of the student in those subjects in his major field of study which are particularly important to the gas industry. The approach can best be illustrated by a brief review of some of the course material.

The course work on natural gas production and processing includes historical and structural geology and a brief review of prospecting and drilling techniques. Study of properties of reservoir rocks provides the background for treatment of fluid movement in reservoirs. The pressure-volume-temperature and phase behavior of hydrocarbon systems are studied in detail. Basic material balances are applied to various types of reservoir fluids and drives, for discussion of storage, withdrawal and deliverability tests and prediction. Applications of phase equilibria and process calculations to gas dehydration and natural gasoline recovery are studied.

In a similar way natural gas transmission covers the concepts of the kinetic theory of gases, gas dynamics, thermodynamics, and boundary layer theory which provide the background for the study of fluid flow, gas transmission and compression. Load variation, fixed and operating costs, and regulatory codes, are taken up in discussing the economics of transmission.

In natural gas distribution, load characteristics and rate structures are studied to define the engineering problems which must be solved. The applications of electronic computers are illustrated in thermodynamic and network flow calculations. Consideration of electrochemistry and soil environments give the fundamentals of corrosion.

The basic approach is especially appropriate in natural gas fuel utilization which takes up the thermodynamics, mechanism, theories, and chemistry of combustion and flame phenomena important to the application and control of combustion. Various types of flames, combustion systems, burner design and substitutability of fuels are also studied. The remainder of the course is spent on the mathematical design of control systems, heat transfer from flames, furnace design, unusual heating operations and protective atmosphere applications.

● Scholarships

Opportunties in the gas industry are not generally appreciated by students in colleges and universities. Therefore, to capture the interest of young engineers in the industry and its operations, IGT has sponsored an undergraduate scholarship program in the gas technology option.

For the past three years, full-tuition junior-senior scholarships have been granted to qualified men on the Illinois Tech campus, who would maintain the required academic standards, work in the gas industry during the summer between their junior and senior years, and give the gas industry fair consideration in seeking permanent employment.

This program did not meet all of IGT's objectives to serve the industry at large, because most of the students were from the Chicago area and a high proportion of them wished to obtain permanent employment in that area. Therefore, a new plan was put into effect in September 1957, which was designed to be of much greater service to the entire industry. In this program approximately five four-year tuition-only scholarships for the gas option in chemical or mechanical engineering at the Illinois Institute of Technology are given to qualified high school seniors in the operating areas of selected member companies of IGT. The company has the major role in selecting the scholarship grantee, since the company is essentially selecting a prospective employee for IGT to train. IGT and IIT rule only on the admissibility of the student to Illinois Tech.

Under the conditions of this grant the student works near his

home for a member company of IGT each of the three summers he is in school. The summer training programs give the company the opportunity to re-examine the student's capabilities, and obtain first-hand knowledge of his development and potentialities; they give the student opportunity to become well acquainted with the company so he should be attracted to it when seeking permanent employment.

The 1957 grants were made to five students from Baltimore, Rochester, Philadelphia, and Portland, Ore. The 1958 grants will be made in cities designated by the Columbia Gas System, East Ohio Gas Co., Cincinnati Gas & Electric Co., Brooklyn Union Gas Co., and Panhandle Eastern Pipeline Co.

Even though this program is in the early stages of its development, a number of companies have become sufficiently interested in it, and the men it will turn out, to consider individual sponsorship of students. This type of sponsorship was initiated in 1957 by East Ohio Gas Co. with the selection of a Cleveland high school graduate. For grants to be made in May 1958, company sponsorship has already expanded to include East Ohio Gas Co., Hope Natural Gas Co., New York State Natural Gas Co. and Peoples Natural Gas Co. Other companies are considering 1958 grants because of the advantages the program has from the company's standpoint in the support of education and infusing men with gas engineering training into their organizations.

● Graduate program

The object of the graduate program is to train men for positions in research and development, education, and possibly for positions in long range technical planning, and to carry out basic research for the industry. IGT is an affiliated department of the Graduate School of Illinois Institute of Technology and gives work leading to the degrees of Master of Science in gas engineering, Master of Gas Technology, and Doctor of Philosophy. The programs normally require one, two, and three-plus years to complete, respectively.

The curriculum for each degree is organized so that full use is made of the excellent instruction available in the regular departments of Illinois Tech. Thus, IGT can concentrate on courses related to the major field of study.

For the Master of Science degree, candidates divide their time approximately as follows: 40 per cent on graduate gas technology courses, 10 per cent on mathematics beyond differential equations, 10 per cent on advanced thermodynamics, 25 per cent in research and thesis, and the remainder on elective advanced engineering and mathematics courses.

The Master of Gas Technology program is approximately the same, for the first year, as the Master of Science program; the second year is essentially devoted to training in business management.

The curriculum for the Doctor of Philosophy requires study distributed approximately as follows: gas technology, 25 per cent; research, 33 per cent; mathematics, 15 per cent; advanced science and engineering, 15 per cent; and the remainder as electives.

A typical graduate course, on fluid flow, includes the following: the thermodynamics, kinetics, and dynamics of gases; development of boundary layer theory and relations for resistance to flow in pipe and other media; consideration of steady and unsteady state flow in pipe; analysis of pipeline flow equations and execution of pipeline design problems; and finally, various theoretical aspects of compressor operation.

The graduate course on methods of scientific research treats the major topics: formulation of the research problem, the statistical significance of data, experiment design and analysis, mathematical tools and instruments, and analytical instruments and methods. The problem of modifying statistical relationships, derived for large data samplings, to use with relatively few test results, is a recurring problem which is taken up in detail.

Past experience has shown that comparatively few gas industry companies actively seek engineers with advanced degrees for carrying out their work. However, the development of men for research and education in the industry, research and development in allied industry, technical planning in large companies, and carrying out basic research for the gas industry, is so important it warrants development of IGT's graduate program to the full capacity of its facilities.

● Financial support

Financial support of graduate students is almost a necessity because of the costs of modern living and the lucrative industrial wages that are passed up by top students during the period of graduate study. To fit the variety of conditions encountered, a number of support programs have been developed at IGT.

A very attractive scheme in the current economy is the *work-study* program. In this program the student spends three days per week in full-time employment with IGT on a basic research problem; full industrial pay rates apply in compensating the man for this work. The remaining two days per week are spent in full-time study. Information developed on the basic research problem may be used as part of the basis for the student's thesis. A tuition allowance is made for the courses taken under the academic program, and full-time employment is provided during any summer spent at the Institute. Under this program three semesters are required to complete the Master of Science curriculum, but the pace is such that the student is prepared in greater depth than in the usual program for his final examinations, and has a superior research effort on which to base his thesis.

A similar program is one in which four days per week are spent in regular work, and one day per week on the study program. Essentially, the same amount of time is spent on basic research, and the extra day in course and text development and assisting with undergraduate course presentation.

Full-time study is provided by the *fellowship* program, in which the student receives between $1800 and $2100, tax-free, during the one academic year required to complete a Master of Science program, in addition to the income from summer employment. Each of these support programs can be extended

for completion of the Doctoral program.

● Training engineers from industry

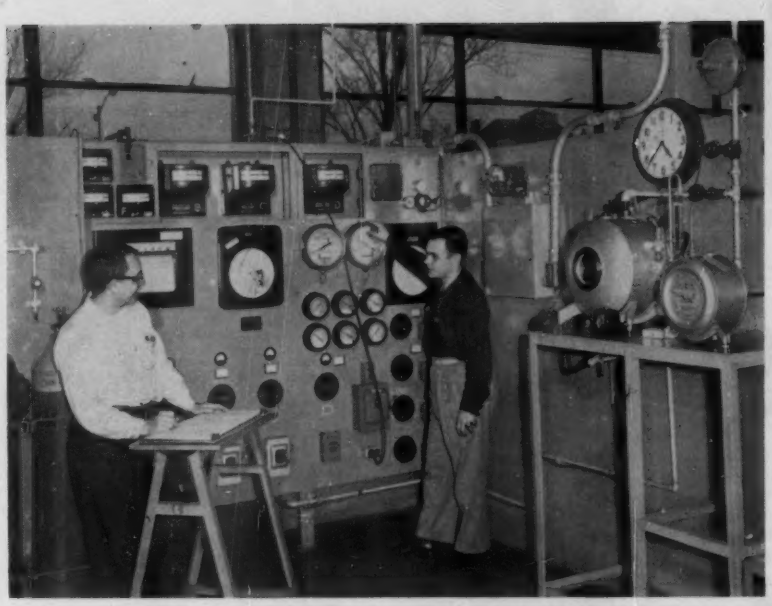
The summer sessions are designed to facilitate the training of technical men in the industry who have had from one to 10 years practical experience. They assist the engineer with a general background to learn more about the specialty in which he is doing his everyday work. They help the engineer with several years of assignment in one area to broaden his acquaintanceship with the industry in preparation for more responsible positions covering a larger field of effort. These sessions have been of significant help to many companies in expediting the cadet training of young engineering graduates.

The courses are at the college senior level and emphasize the solution of frequently encountered problems. Only sufficient proof of theoretical developments is presented as is necessary to give the practicing engineer the correct feeling for the validity of the relationships he uses in routine work, and the points in which care should be taken in extending them to new or unusual conditions.

IGT instructors present the fundamentals behind each operation, and lead the discussion on current techniques. In some cases outstanding authorities from the industry lecture so the enrollee can have the benefit of as much actual field experience as possible. This approach is especially valuable in showing how the purely technical approach to a problem must be modified to meet the requirements placed on operations by various legislative and regulatory bodies.

These sessions have been very successful. Many men from Canada have attended them. One man travelled from Pakistan to attend the full series; grants will be made by organizations in Great Britain to permit men to attend the 1958 sessions. Each year enrollment applications must be refused to keep classes at a size which permits an intensive problem approach, penetrating class discussions, and assistance on each man's problems.

The Home Study Course program



Scholarship winners Thomas H. Horton (left) and Robert B. Rosenberg, chemical engineering-gas option students, working on their senior year research project on reaction kinetics.

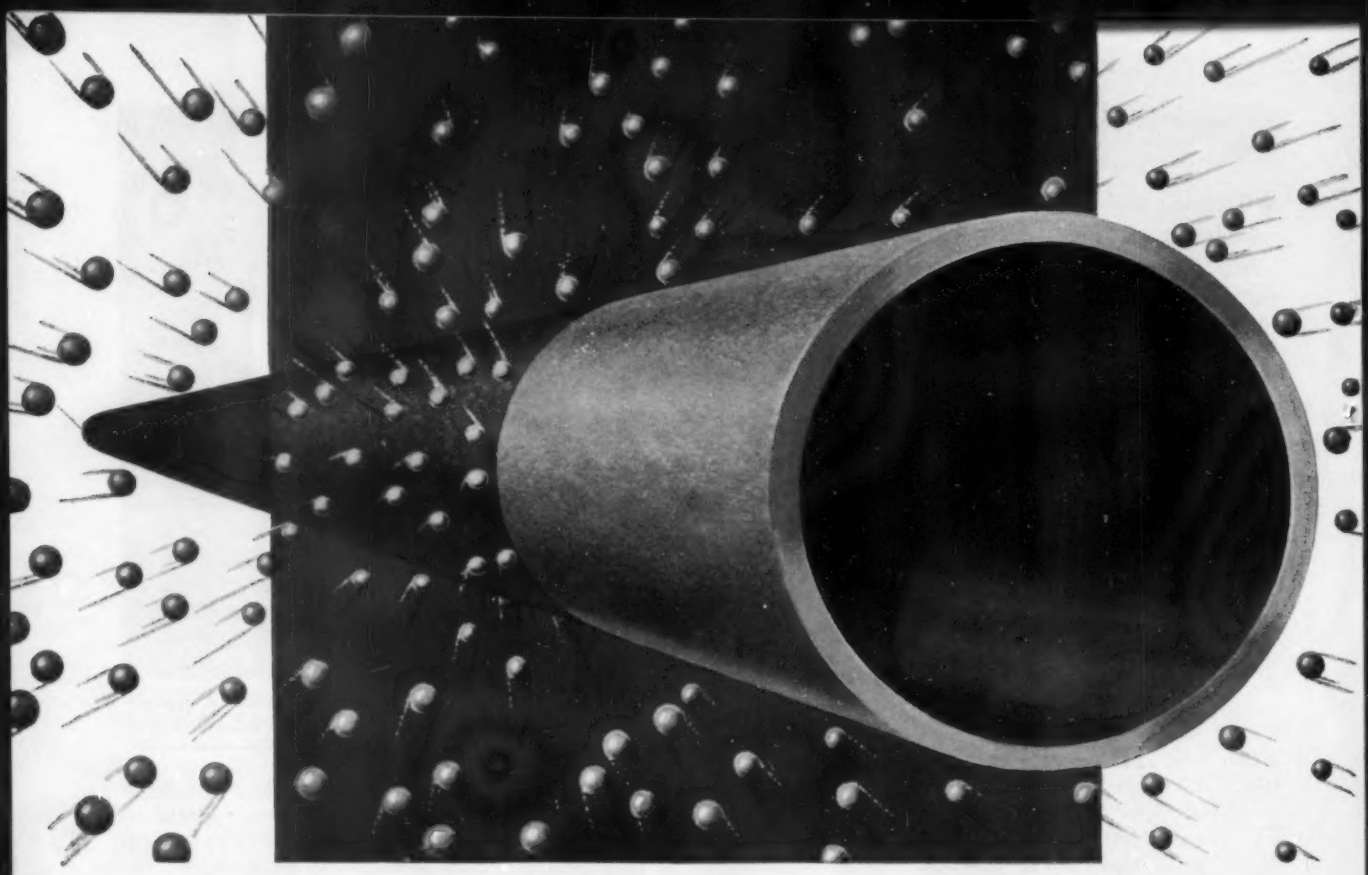
is designed to assist people throughout the industry to gain greater knowledge of the industry's operations without leaving their places of employment. The courses are developed with the objective that they be understandable to the high school graduate, but contain sufficient information to be worthwhile to the young technical graduate in other fields. Only one course is available at the present time, *Natural Gas Production and Transmission*. This course has been widely accepted by industry; over 1900 copies have been sold to date. Many have gone to foreign countries, where the natural gas industry is only now beginning to develop. A complementing course, *Natural Gas Distribution*, is under preparation and will soon be available to the industry.

● Need for review

A successful education program must be dynamic. Courses must be brought up to date continually, and text material be under constant revision. Under the present international stresses, the rigor and academic level of instruction must be raised to meet the competition of foreign technology. The needs of industry must be anticipated far enough in advance that men with adequate training are available when need arises. The many problems which will be encountered in meeting economically the tremendous demands to be made for energy in the next generation must be recognized now for competent personnel to be developed in time to solve the problems which will arise because of these demands.

IGT has developed its program to dispatch its responsibility as the research and education facility for the gas industry, and help train people to solve one phase of the great energy supply problem. It is now important that many more capable young men be attracted to this field of study. IGT will gladly work with any company to develop a scholarship program which will meet its needs.

Finally, job re-evaluation, with concentration of the demanding, non-routine work in truly professional engineering positions, has been suggested by several authorities as a means of reducing the number of highly qualified engineers needed by a company. It would also serve to maintain a long-term challenge for the top-level man and permit paying him a premium salary. Such positions and adequate compensation will provide the best attraction to able students, and ensure adequate return from industry-supported education programs such as the one at IGT. ■



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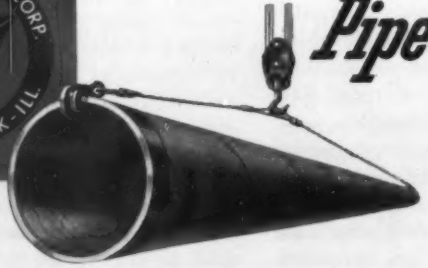

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By FRANK CHAPMAN

Linking a widespread system

MICROWAVE communications is now a common tool in the natural gas industry. One of the real pioneers in microwave is Transcontinental Gas Pipe Line Corp., Houston. Construction of its microwave system moved northeastward from Houston in the fall of 1950.

Contractors' and Transco's crews opposed the natural elements to put the system in. They hit rain and snow, frozen ground and mud. After completing the construction of the communications system—which parallels Transco's pipeline system, of course—into Linden, N. J., crews came south and worked from Houston into Texas' Rio Grande valley. When they were through, Transco's communications from Falfurrias, Texas, to Linden, and there between, were just a handset away.

In early 1953 the 1840-mile, privately owned microwave system went into operation. There were 59 towers spanning the nation along Transco's pipeline. Of these, 36 were isolated relay stations. Equipment was well standardized, the difference being designed in relation to the use.

Twelve two-way channels maxcapacity were designed into the initial installation. But, only seven north from Houston and three south were used. The system then had 19 compressor stations and each was tied-in to send and receive over two voice channels.

In February 1957, the microwave system was given a major revamping. A time-division multiplex system was installed. The changeover was officially Feb. 23. But, that was the culmination of nine months of study, planning and preparation for Superintendent of Communications H. A. "Dusty" Rhodes and his department's personnel.

The changeover affected all stations in and between Houston and Linden. The system to the south was not converted. A weekend was chosen and the communications department simultaneously removed old equipment racks and replaced them with the new multiplexing equipment racks at all communications stations in the Houston-Linden section of the system. Few of Transco's other personnel realized that a change had been made.

Eleven voice channels were made available from Houston to Linden, and points between, by the changeover. From one station to another or to Houston, three voice channels (instead of two) are open. And two additional trunk lines, one from Houston to compressor station 12 and the other from 12 into Linden were added.

Then, for the 1957 construction season, 14 channels became available to the northeast. A potential total of 24 voice channels will be available with the new equipment. This is double the maximum of the initial system.

The time-division multiplex equipment was developed by General Electric. G-E had technicians in the field for Transco's changeover. The more modern equipment is being installed in all new compressor stations regardless of their location.

So, Transco now operates with a newer, simpler, more efficient longline microwave communications setup. The equipment is more stable, has fewer tubes, and there is less of it—hence, it requires less maintenance.

THE sprawling and powerful American Telephone & Telegraph combine is going to get a goingover from congressional investigators this spring.

A House Judiciary subcommittee has decided to probe the massive utility, focusing particularly on the terms and enforcement of a 1956 antitrust consent judgment worked out by the firm and the Justice Department.

The communications policies of AT&T will be one of the prime subjects of the probe.

One of the provisions of the antitrust agreement with the Justice Department was requirement that the parent AT&T, and its subsidiary, Western Electric, get out of unregulated businesses, such as leasing and maintaining facilities for private communications.

Gas firms and other private communications users, particularly in the mobile radio field, have been fighting an AT&T proposal now before the Federal Communications Commission which might let the firms get back into the business. This would be accomplished, under the utility proposal, by having the FCC accept for filing tariffs on lease-maintenance services for mobile communications systems.

Rep. James Roosevelt (D-Calif.) has charged that the antitrust agreement between the government and AT&T would be violated if the FCC accepts the tariffs. The Justice Department on at least two occasions has darkly warned the FCC that it would have to reopen the antitrust case if the tariffs are accepted and the commission gives AT&T permission to get into lease-maintenance operations.

In addition, the department has warned the FCC against any actions granting the telephone utility too broad operations in its upcoming new microwave frequency allocations which might hurt private users of these facilities. ■

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Note the lack of smoke, heat and fumes (there aren't any with Polyken taping). Note the small crew (about half the size of hot dope crews). Labor costs are low.

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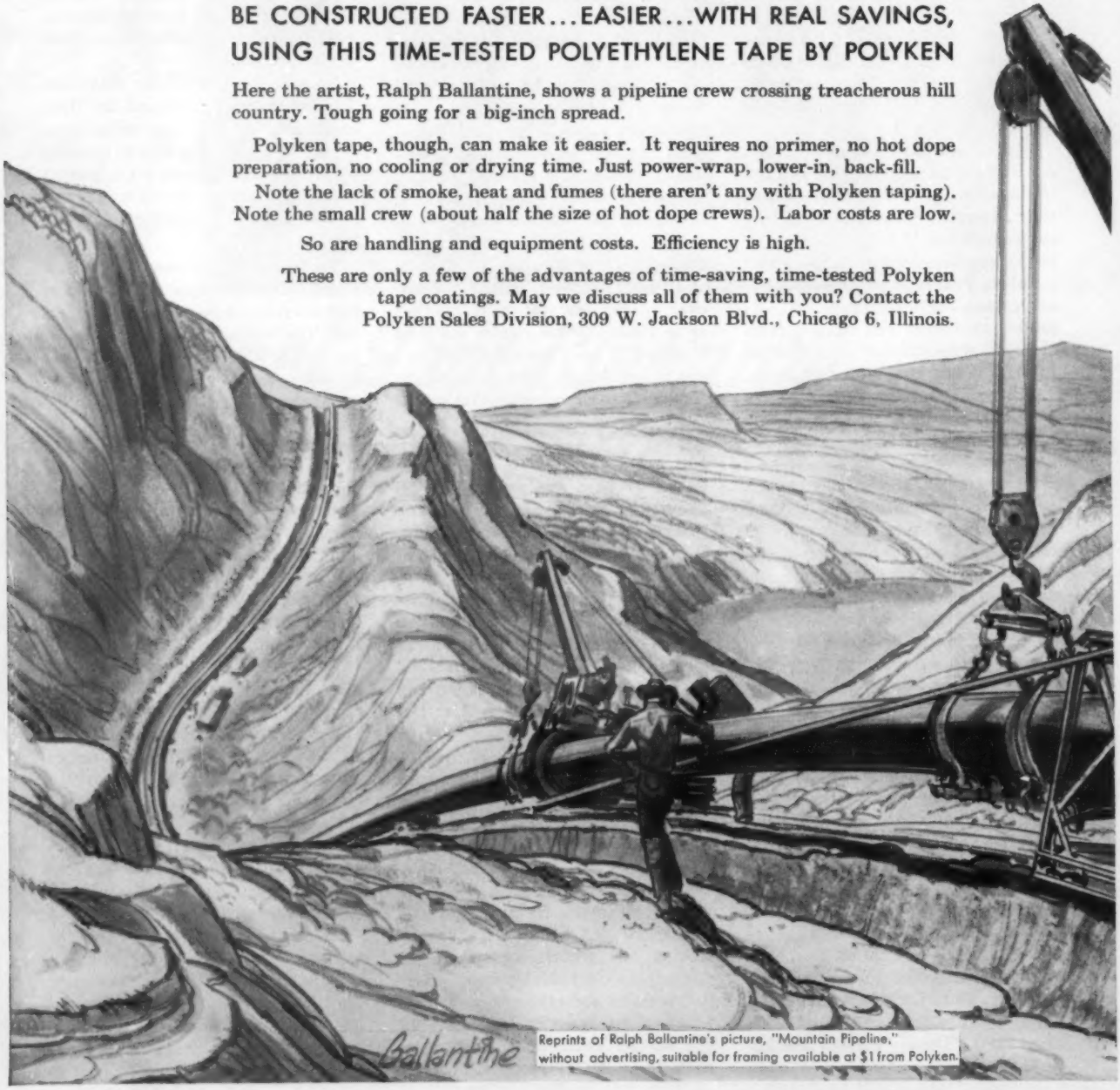
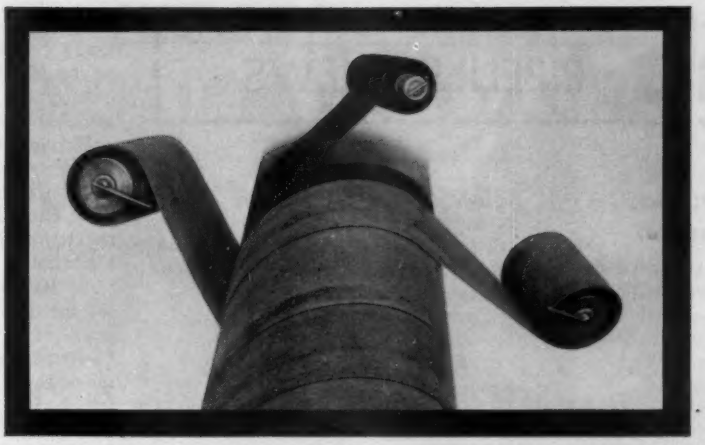
These are only a few of the advantages of time-saving, time-tested Polyken tape coatings. May we discuss all of them with you? Contact the Polyken Sales Division, 309 W. Jackson Blvd., Chicago 6, Illinois.



Reprints of Ralph Ballantine's picture, "Mountain Pipeline," without advertising, suitable for framing available at $1 from Polyken.



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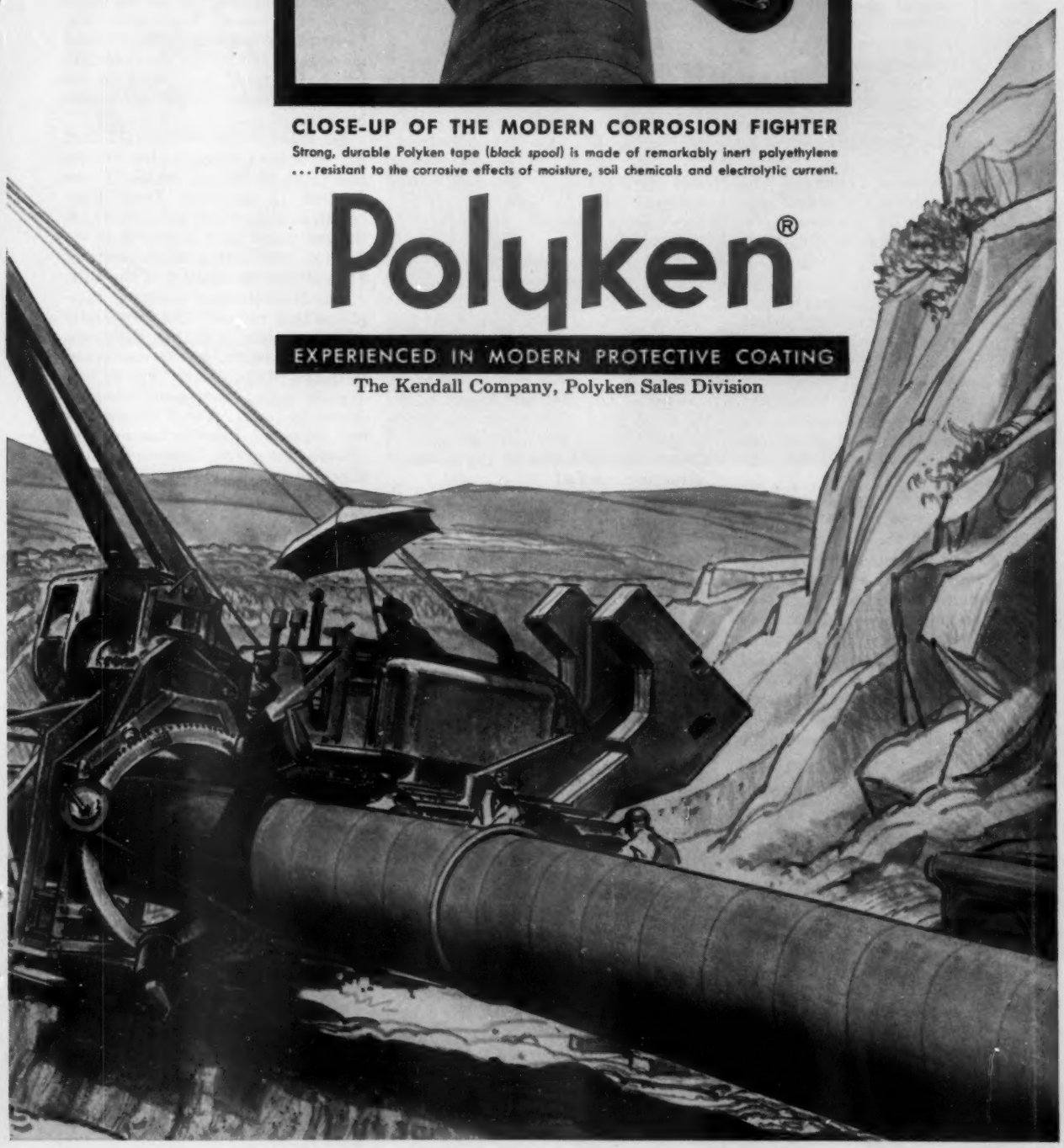

GAS • PIPELINE NEWS

Expert forecast: Gas supply outlasting oil

At present and anticipated rates of consumption, foreseeable supplies of natural gas will outlast those of petroleum, experts told the Society of Petroleum Engineers meeting in New York.

Lyon F. Terry, petroleum consultant of Lehman Bros., and John G. Winger, petroleum economist of the Chase National Bank, were the speakers.

Present known reserves and future discoveries of natural gas, including those in offshore fields, will exceed 1,200,000,000,000,000 cu ft, they said. They also said that demand for gas will increase 4.7 per cent a year for the next decade.

Although the gas industry should enjoy a rapidly growing and long-time future prosperity, the report from the experts also contained a threat. And that is that more than 80 per cent of the gas needed for the industry's future progress consists of supplies yet to be discovered.

"The day of surplus gas and cheap gas is over," they said. "From here on the consumers will have to pay the increasing costs of the producers and explorers, who will need to be accorded sufficient profit and freedom of action to stimulate them to continue exploring for new reserves of natural gas."

Mr. Terry also predicted that an all-time peak of production of some 20 trillion cu ft a year would be reached by 1980-90.

New California gas supply proposed

Pacific Lighting Corp.'s two distribution subsidiaries have signed an agreement to receive substantial supplies of natural gas from a proposed West Texas - to - California pipeline.

The new line would be built by Transwestern Pipeline Co. (Houston). Initially, it would deliver 350 MMcf/day to Southern California and Southern Counties Gas companies (Los Angeles). A third Pacific Lighting subsidiary, Pacific Lighting Gas Supply Co., would actually buy the gas from Transwestern at the California-Arizona border, and pipeline it to the metropolitan Los Angeles area.

Pacific Lighting President Robert A. Hornby said the Transwestern line ultimately would have a daily capacity of 640 MMcf. Mr. Hornby said he expected deliveries to begin late next year.

Transwestern has been formed by Warren Petroleum Co. (Tulsa), Monterey Oil Co. (Los Angeles), and J. B. Butler, Houston consultant. John R. McMillen, executive vice president of Monterey, is president of Transwestern.

The new pipeline is now lining up gas supplies in the San Juan and Paradox basins, and in west Texas. A total of 2 trillion cu ft in proven reserves is the company's goal before a filing is made with FPC.

Cost of the new line is expected to reach $200 million. It will consist of some 1200 miles of 30-in. The company hopes to begin construction this fall.

Mich Con and Panhandle draw battle lines

Battle lines have been drawn by Michigan Consolidated Gas Co. and Panhandle Eastern Pipe Line Co. with a series of charges and counter-charges on gas supplies.

In mid-February Michigan Consolidated sued Panhandle for $17 million for "illegally depriving Mich Con and its customers of huge quantities of natural gas during the past six years."

The suit charges that since Feb. 20, 1952, Panhandle has been required by orders of the FPC to sell Mich Con and its other utility customers the large quantities of excess gas which it has had available on its pipeline system.

Panhandle's chairman, W. G. Maguire, states that the suit "is completely without merit." He said Panhandle has had no contract to sell gas to Michigan since Dec. 31, 1951. In the period since then Panhandle has been delivering 127 MMcf/day to Michigan under specific orders of the FPC. Michigan Consolidated claims that it has made repeated efforts to purchase up to 100 MMcf/day of additional gas from Panhandle for storage and for sales to industrial plants.

Panhandle, Mr. Maguire says, has pending an application for complete abandonment of this service. The case has been tried and is awaiting decision by the presiding examiner.

In its complaint, Michigan Consolidated contends that during these past six years, Panhandle has "wrongfully and unlawfully" sold more than 100 billion cu ft of gas which it should have sold to its utility customers on an interruptible basis.

Michigan Consolidated said that the difference between the wholesale price of the gas which it was entitled to purchase from Panhandle and the resale price at which the gas would have been sold to industrial users totals approximately $17 million, the amount of the suit.

The Detroit-based company complains that not only did Panhandle fail to comply with the February 1952 FPC order, but it continued to make illegal sales and subsequently asked the commission to cancel its order. The FPC refused the requested cancellation and reaffirmed its order. Panhandle then appealed to the courts to set aside the FPC order, but this appeal was denied.

Then, late in February, Panhandle charged that Michigan Consolidated and its affiliates "are arrogantly defying the authority" of the FPC and the U. S. Supreme Court in a belated "artificial" attempt to halt Panhandle's sale of natural gas to a Canadian company.

Panhandle further charged Michigan Consolidated and its affiliates with "reprehensible conduct" in attempting to disrupt the Canadian gas industry and governmental affairs.

In a document filed with the FPC, Panhandle recited a tale of Michigan Consolidated's "cynical duplicity" wherein "Michigan Consolidated is shown to have, in one legal forum, been attempting to block Panhandle's export of gas to Canada while in another forum was laying plans to export gas itself to the same section of Ontario."

This was Panhandle's formal reply to a plea made by Michigan earlier to the FPC attempting to reopen the Panhandle export matter despite a two-month-old Supreme Court ruling that the case was closed.

More than 477,000 horsepower of

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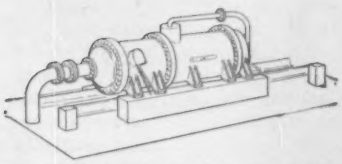
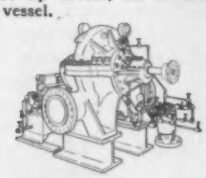
for NATURAL GAS SERVICE

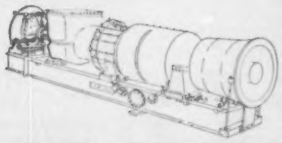
I-R *"FIRSTS"* in Centrifugal Gas Compressor History



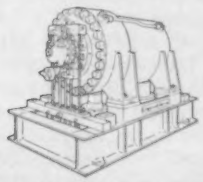
FIRST CENTRIFUGAL PIPE-LINE COMPRESSOR Built by Ingersoll-Rand in 1931, this centrifugal pipe-line booster consists of a six-stage compressor driven by a 3550 rpm, 3000 hp motor, all encased in a pressure vessel.



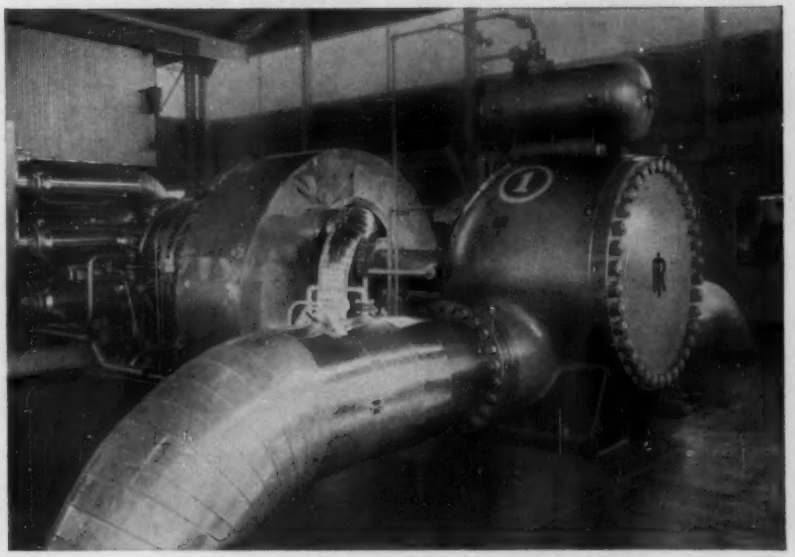
FIRST COMMERCIAL APPLICATION of centrifugal pipe-line compressors was made in 1947. A total of 78 electric-motor-driven, single-stage I-R centrifugals were installed, to handle approximately 250 mmcfd.



FIRST GAS-TURBINE-DRIVEN UNIT Installed in 1949, this Ingersoll-Rand centrifugal compressor, powered by an 1850 hp simple cycle combustion gas turbine, was the first gas-turbine-driven centrifugal compressor developed and applied to pipeline service, and was designed for a flow of 192 mmcfd at a ratio of 1.18.



FIRST 2000 PSI CENTRIFUGAL GAS COMPRESSOR This Ingersoll-Rand 5000 hp double-case centrifugal compressor was the first unit ever built for handling natural gas at a discharge pressure of 2000 psi.



One of 12 Ingersoll-Rand centrifugal compressors on a large natural gas pipe-line.

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Panhandle told the commission: "Documentary evidence of Michigan Consolidated's motive in persistently attempting to terminate Panhandle's export deliveries has recently come to light."

Panhandle claims that there is now on the public record a letter signed by the chairman of the board of Michigan Consolidated and American Natural Gas Co., its parent, proposing the formation of a new company "to deliver volumes of natural gas to eastern Canada in the Windsor-Sarnia area," which is exactly the point where Panhandle's deliveries to eastern Canada are made.

Panhandle ridiculed Michigan Consolidated's "attempt to drag in Panhandle's application to end service to Detroit and serve other customers including those in Michigan with which it has contracts. The two matters, Panhandle told the commission, had no bearing on each other and were being combined by Michigan Consolidated only as a device "to confuse the issues."

The third voice heard in the fray was Illinois Power Co., Decatur, Ill., who wants more gas from Panhandle.

Illinois Power's protest was scheduled for hearings in March along with Panhandle request to make additional direct industrial sales. In Docket G-10699, Panhandle seeks authority to deliver a total maximum of 16.4 MMcf/day to 10 direct, interruptible, industrial customers in Michigan, Illinois, and Indiana. These customers have been connected and served without prior FPC authority. Panhandle also seeks authority (Docket G-12822) to provide interruptible gas service to Cabon Carbon Co. at Tuscola, Ill. This delivery would not exceed 500,000 cu ft/day with annual deliveries estimated at 20 MMcf in the first year and 100 MMcf in the fifth.

In addition, Panhandle filed a petition (G-1612, et al) seeking an extension of authorizations to serve seven industrial customers in Missouri, Ohio, Illinois, and Indiana. These customers had a limited authorization period starting in 1952. This period has now expired.

In its filing, Illinois Power says it has unsatisfied requirements for more gas during off-peak months amounting to about 9 MMcf/day.

Illinois Power also complained that Panhandle's refusal to sell additional off-peak gas was unjust, unreasonable, etc. It petitioned for an order modifying or ending Panhandle's export (Docket G-2475) of an additional 15.5 MMcf per year to Union Gas Co. of Canada Ltd. and directing delivery of part of these volumes to Illinois Power.

Oklahoma-to-St. Louis operation sold

Alaska Juneau Gold Mining Co. (Los Angeles) has bought out the interests of promoters who were seeking to build a natural gas pipeline from Oklahoma to St. Louis.

Mookl Chemical & Gas Corp. (Tulsa) and Missouri Transmission Corp. (Springfield, Mo.) have sold their interests to Alaska Juneau. The Los Angeles firm says it will continue the plans to build the 425-mile, 16-in. pipeline.

As a starter, Alaska Juneau has hired consulting engineers to evaluate reserves which they say are signed up or committed. They hope to file an application with FPC within a few months. An earlier Mookl-Missouri filing was rejected by the commission.

Alaska Juneau is an old mining company which also has hydroelectric power interests in Alaska and manufacturing interests in Missouri. It is headed by C. J. Ver Halen, Jr., president.

Paul Kayser comments on Memphis decision

While testifying recently before the FPC, El Paso's Paul Kayser was asked how the Memphis decision would affect his company's plans. His answer: "If the principle announced in the Memphis case were applied to our contracts we would be unable to expand further, and would, like everybody else, have a very difficult time maintaining service."

Mr. Kayser's testimony was heard during FPC hearings on El Paso's Dockets G-12580 and 11797 covering construction of $162 million facilities to add 285 MMcf/day to its system capacity.

Mr. Kayser further declared that it would "hurt the El Paso company and its investors worse to abandon these certificates now than it would to go forward even if Memphis were against us." Then he continued: "But I am perfectly willing to say that you can't operate under Memphis. You cannot expand and you cannot fully perform."

FPC Staff Counsel Knight also queried Paul Kayser regarding a California PUC order directing California customers of El Paso to file motions with the FPC—based on the Memphis decision—to prevent El Paso's rate increase from going into effect. (El Paso's Counsel Grambling objected to this question. The FPC had issued its opinion denying the motions filed by the California companies.) The examiner then asked whether the California commission order will affect El Paso's plans for expansion either in the applications now pending or any contemplated plans for the future.

Mr. Kayser said that "so far as I am concerned, in my opinion it has no effect on our present expansion in these two applications. If the objectives set forth in that order . . . were accomplished, it would greatly hamper and make practically impossible further expansion beyond this order. . . . I am perfectly willing to frankly tell you that as to further expansion nobody is going to be able—and we are just like everybody else—to carry out any substantial expansion until the proper procedure is developed, let's put it that way, by which the investor can be assured of getting a reasonable return on his money when he puts it in a natural gas pipeline company."

Major expansion jobs consolidated

Four applications requesting FPC authority for $165 million facilities have been consolidated with 34 applications seeking to sell gas.

Transcontinental Gas Pipe Line Corp., Houston, seeks permission (Docket G-13143) for construction of about 145 miles of purchase laterals and appurtenant facilities. These would run from producing fields in LaFourche and St. Charles parishes, La., to Transco's mainline near the Mississippi-Louisiana border. Estimated cost: $14.1 million.

In another application (Docket G-13745), Transco proposes installing an additional 10,000 compressor hp in its mainline stations to enable it to provide up to 22,010,000 cu ft daily of firm long-term deliveries to Atlanta (Ga.) Gas Light Co. Estimated cost: $3 million.

In a third application, and the largest (Docket G-13590), Transco proposes construction of 556 miles

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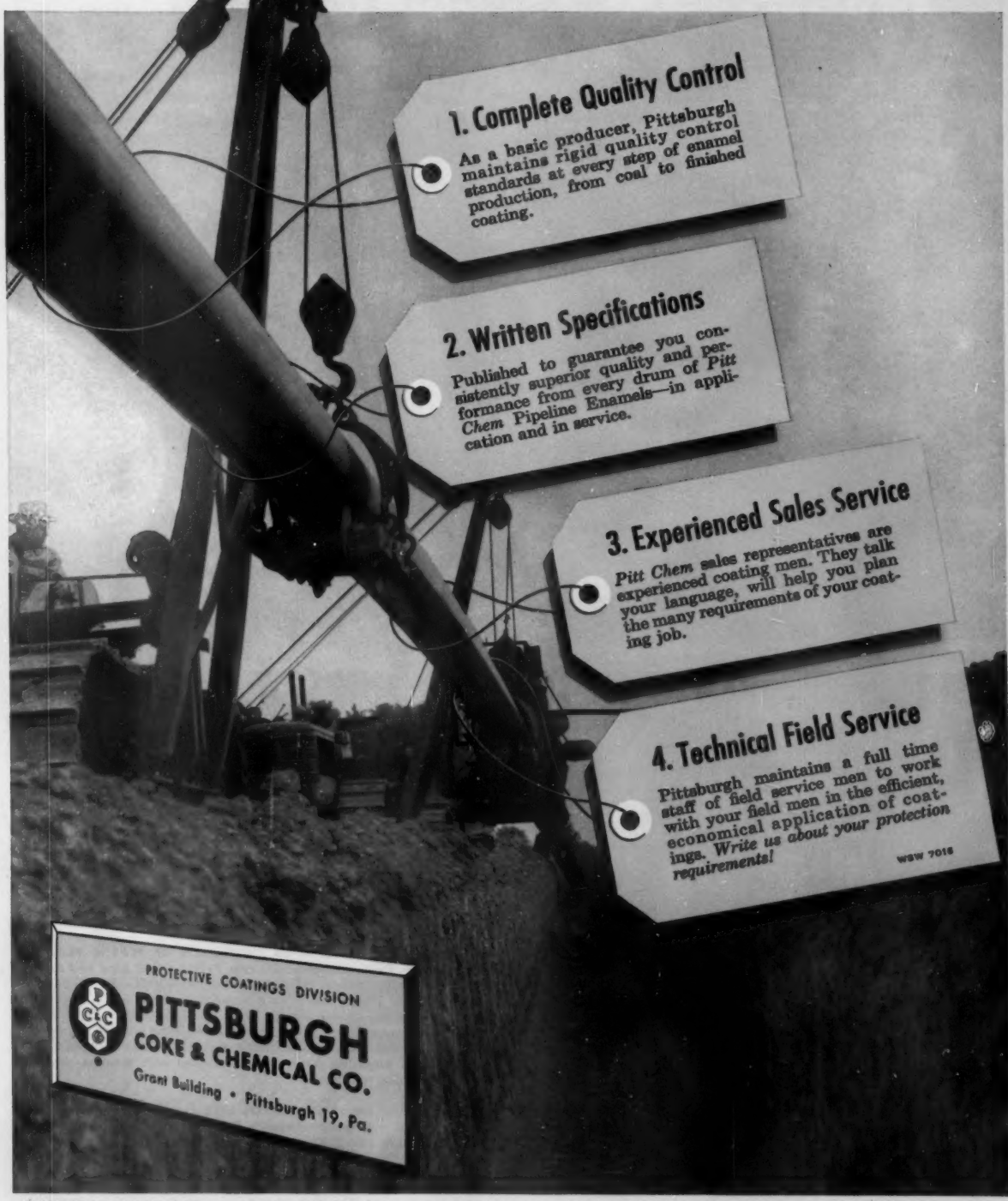
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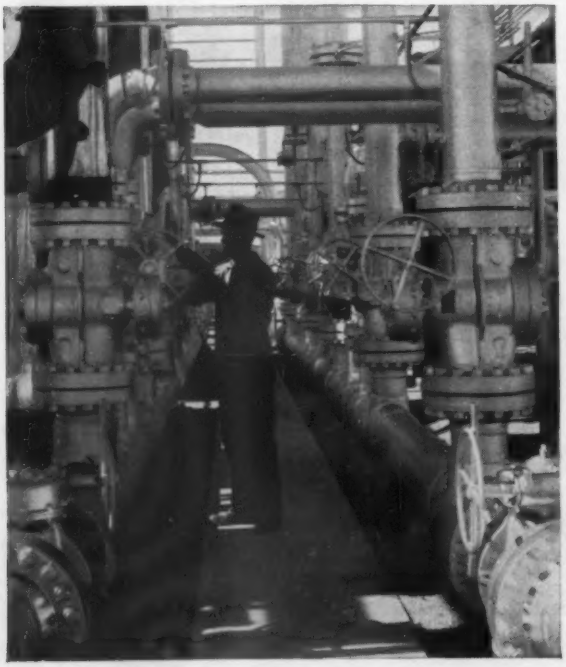

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of transmission line, 38,580 compressor hp, and about 345 miles of purchase laterals connecting new gas supplies in southern Louisiana, Texas, and offshore Louisiana.

These last facilities would be used to render additional firm service, totaling some 200.6 MMcf/day to 27 existing customers, including a 50-MMcf/day transportation service for Consolidated Edison Co. of New York, and 181 MMcf/day of proposed new storage service for 11 customer companies. This job would cost about $135.8 million.

In yet another filing, New York State Natural Gas Corp., Pittsburgh, and Texas Eastern Transmission Corp., Shreveport, join forces with Transco (Docket G-13793). The companies want to transfer undivided interests in the Leidy and Tamarack fields in Potter and Clinton counties, Pa., from New York Natural to Transco and Texas Eastern, together with the acquisition, construction and operation of the Leidy field as a storage pool.

Ultimate development of both storage pools would cost $25.1 million. Initial development cost is approximately $12.1 million, of which Transco will spend $11.5 million and Texas Eastern $568,500.

South Louisiana gas goes to United Gas Pipe Line

United Gas Pipe Line Co., Shreveport, has FPC authority, subject to review, to attach additional gas reserves in the Ridge and North Leroy fields in Lafayette parish, La. (Docket G-1221, et al).

United will build about 6 miles of 8-in. line to move the gas it is buying from three independent producers. Combined reserves in the fields are estimated at about 123.3 billion cu ft.

Although the FPC staff thought the attachment of a rate condition "would be in the public interest," the examiner concluded that no such condition should be imposed. The contracts provide for a price of 20.5 cents/Mcf for the first five years. The price goes up 1 cent in each of the succeeding five-year periods, to 23.5 cents during the fourth five-year period. The price would be 24.5 cents/Mcf thereafter as long as the contracts remained in effect.

The examiner noted that the prices are higher than any others in the south Louisiana area. But, he said, the mere fact that the rates are higher than those United is paying or than the producers are receiving in the area would not seem to establish that they are unreasonable.

GAS • Pipeline Notes

T. D. Williamson Inc. has appointed John P. Reeves & Co., corrosion engineers in Salt Lake City, as exclusive representatives in Utah, Montana, and Idaho.

The Federal Power Commission has issued its Dec. 31, 1957, map of "Major Natural Gas Pipelines" in the United States. Existing pipelines, those under construction, those which have been authorized and not yet started, and proposed lines pending commission action are shown. Copies are available from the FPC, Washington 25, D. C., at 25 cents a copy. Order number is FPC-M-51.

J. F. Pritchard's latest contribution to cooling tower technology is contained in a manual entitled "Counterflow Cooling Tower Performance." The 85-page publication contains reliable and complete information on cooling tower selection and performance. It is available from the company, 4625 Roanoke Parkway, Kansas City, Mo., for $3 a copy.

A firm specializing in engineering services relating to corrosion control in the petroleum and pipeline industries has been organized in Houston. Heading the new operation, World Supply Co., is O. W. Wade as president. Mr. Wade, formerly chief corrosion engineer for Transcontinental Gas Pipe Line Corp., has been chairman of the AGA's corrosion committee.

The FPC recently:

Approved Transcontinental Gas Pipe Line Corp.'s Docket 13834 to build about 23 miles of 6- and 8-in. purchase laterals and four purchase meter stations in Atascosa county, Texas. The $705,000 job will enable Transco to receive gas bought in the Pleasanton and South Pleasanton areas of the country.

Okayed Hope Natural's plan to build a measuring station, field lines, metering facilities and to drill wells in Randolph county, W. Va. The $959,000 job (Docket 12571) will be used to sell gas to Atlantic Seaboard and to deliver gas to Atlantic for the account of United Fuel Gas Co. Under the proposal, Atlantic will receive up to 90 MMcf/day from Hope, including about 49.5 MMcf for United.

Agreed to Cities Service Gas Co.'s proposal to construct and operate new facilities in Kansas and to abandon other facilities in Texas, Oklahoma and Kansas (Docket 13562). For approximately $3.6 million, Cities Service will build a 7000-hp compressor station and 6.3 miles of 30-in. line in Montgomery county, Kan. And, 18 miles of 26-in. line in Anderson and Franklin counties, Kan. Deliveries from the company's Elk City storage field will increase from 421.6 MMcf in 1957-58 to 521.1 MMcf in 1959-60.

Okayed budget-type construction by United Gas Pipe Line Co. Under Docket 13326, United Gas proposes to build new field facilities during 1958 so that it can take gas from adjacent production areas into its main system. The FPC limited construction expenditures to not more than $3 million for the year and not more than $400,000 for each single project.

Approved Arkansas Louisiana Gas Co.'s budget-type construction (Docket G-13328). The gas supplies connected will enable the company to make sales to industrial customers.

Authorized El Paso Natural Gas Co. (Docket G-13252) to spend about $2.4 million in Crane county, Texas, and Lea county, N. M. The new facilities will be used to buy, process and transport an increase of about 16.5 MMcf/day over and above the previously authorized volumes being received from the area.

Accepted Southern Natural Gas Co.'s application for authority to build about 12.5 miles of 10¾-in. line and a measuring station so that it can receive gas produced in the Tantine field in Plaquemines parish, La. In its application (Docket G-13864), Southern Natural said it can take a maximum of 13.5 MMcf/day and that the proven recoverable reserves available under contracts total 57.5 trillion cu ft of gas.

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For here is a heavy-duty *industrial* tractor on rubber that can drive anywhere, anytime, at 17.6 MPH . . . *dig up to 90′ of 4′ trench per hour* . . . turn around and handle all backfilling and cleanup with the same machine and same operator. So you save investment, save operating cost.

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Value Comparison Chart

Feature	Case "320" Backhoe-loader	Tractor "A" w/Backhoe-Loader "X"	Tractor "B" w/Backhoe-Loader "Y"
Backhoe			
Digging depth	12′6″	12′	12′ (a) 13′ (b)
Loading height	10′7″	9′2″	8′
Hydraulic foot swing control	YES	NO	NO
Pump capacity	19 GPM	13 GPM	12 GPM
Loader			
Bucket capacity	13 cu. ft.	9 cu. ft.	11 cu. ft.
Lift capacity	3100 lbs.	1200 lbs.	1500 lbs.
Self-leveling bucket	YES	NO	NO
Tractor			
Engine displacement	148 cu. in.	172 cu. in.	134 cu. in.
Front axle	1 piece Forged Industrial	3 piece Agricultural	1 piece Industrial w/spindles
Shuttle transmission	YES	NO	NO
Power-steering	YES	NO	YES
Travel speeds, MPH			
Forward	(8)1.6 to 17.6	(5)2.1 to 11.21	(6)1.18 to 12.96
Reverse	(8)2.0 to 21.8	(1)3.6	(2)1.57 to 6.29
Tires — Standard			
Front	7:50-16 (6 ply)	6:00-16 (4 ply)	6:00-16 (4 ply)
Rear	13-24 (6 ply)	10-28 (4 ply)	11-28 (4 ply)

Above data based on latest specifications available to us at time of printing.

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pipeline news • *Cont'd.*

Accepted application (Docket G-13667) from Kentucky Gas Transmission Corp. The Charleston-based company proposes to construct 20 miles of 26-in. line paralleling its existing line from Foster regulating station in Bracken county, Ky., northwesterly to its Cold Springs measuring station in Campbell, Ky. The $2.1 million job will increase Kentucky's system to meet anticipated peak-day demands in the Cincinnati area.

Accepted Gulf Interstate Gas Co.'s application (Docket G-13648) to spend $2 million on new facilities in 1958. With the new facilities, Gulf Interstate will be able to take into its system gas which it will transport for United Fuel Gas Co.

Accepted Manufacturers Light & Heat Co.'s application (Docket G-12155) to build new facilities and abandon others in Ohio and West Virginia. The $1.1 million job consists of a 16-in. river crossing and a metering and regulating station.

Received application from Southern Natural Gas Co. (Docket G-13203) for construction of gas gathering facilities in Louisiana. At a cost of $4.1 million, Southern Natural proposes to: build 45.3 miles of various size supply laterals; add 2000 hp at its Toca compressor station and 660 hp at its Franklinton station.

Accepted El Paso Natural Gas Co.'s plan to spend $4 million in Crane and Pecos counties, Texas (Docket 13822). About 59 miles of 20-in. line will be built in Crane county; a dehydration plant with a capacity of 50 MMcf/day will go into Pecos county; and about 9 miles of field lines will be installed, together with metering and communication facilities. El Paso will purchase, gather, dehydrate and transmit about 50 MMcf/day from the Puckett field in Pecos county when the new facilities are completed.

Accepted Michigan Gas Storage Co.'s proposal (Docket G-14465) to spend $4 million to help meet demands of Consumers Power Co. Forty miles of 26-in. line would be built and 25 new wells would be drilled in its Winterfield and Cranberry Lake storage fields.

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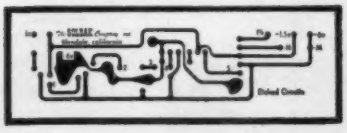

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M. E. Bless
Texas Gas

JAMES G. ELLIOTT is now superintendent of right-of-way for the 9-state area in which Texas Gas Transmission Corp. pipelines are located. Other Texas Gas appointments include: M. E. BLESS, who will supervise right-of-way activities in Kentucky, Illinois, Indiana, and Ohio, and W. T. TURNER SR., who heads right-of-way operations in Tennessee, Mississippi, Arkansas, Louisiana, and Texas.

Responsibility for coordination of natural gas sales development, and for efforts toward the industrial development and growth of the area served by Texas Gas Transmission Corp. have been reassigned. DENNIS L. NEWBURY and GLOVER H. CARY JR., both members of the company's sales and customer relations staff, are manager of gas sales and industrial representative, respectively.

Texas Gas Transmission Corp., Owensboro, Ky., has promoted WILLIAM B. FOWLER to the post of assistant director of the property taxes department.

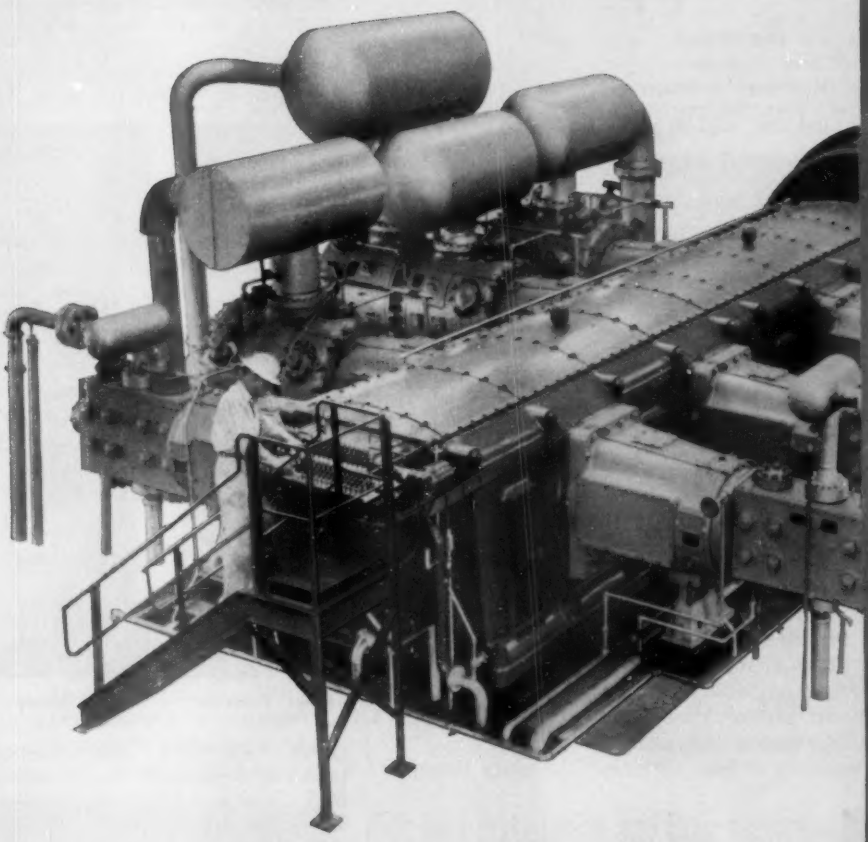
A. B. AYCOCK is plant superintendent for Southern Pipe Coating Co., Atlanta, Ga. Since 1936, Mr. Aycock has been superintendent of production at Mayes Brothers Inc., Houston.

W. T. Turner, Sr.
Texas Gas

A. B. Aycock
Southern Pipe

America's most powerful compressor

THE 10,000 HP COOPER-BESSEMER LM



Designed for the continuous compressing of large volume gas or air . . . in petrochemical, chemical, refinery and industrial operations . . . this 10,000 hp Cooper-Bessemer LM compressor not only delivers efficiency, economy and availability, but occupies no more space than other units of half the horsepower.

Proved by thousands of operational hours

the basic LM design offers you the very latest in design and engineering development. The nearest Cooper-Bessemer office will gladly furnish complete information.

THE LM COMPRESSOR OFFERS YOU THESE TEN IMPORTANT ADVANTAGES:

- natural force balance design for vibration-free operation
- lowest investment per horsepower
- greatest power-to-space ratio
- low installation cost
- minimum maintenance requirements
- main frame of high strength Meehanite Metal
- rod load rating, 125,000 psi
- pistons can be removed without disturbing compressor piping
- extreme accessibility
- greatest availability for multi-stage, multi-service requirements

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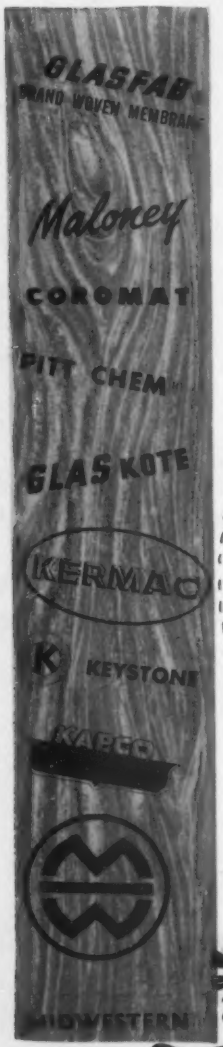
A Specialty of the House —

"BRANDED PROTECTION"

for pipe lines!



For over a dozen years, Midwestern has led the field in protecting pipe from corrosion and abuse, whether above or below ground. Our field-trained technicians specify only the highest quality "top-brand" materials to assure faster and easier application, longer life, tougher reinforced coatings . . .

Regardless of job conditions, *one or a combination* of these excellent products will furnish the "branded protection" you need — "GLASFAB" and GLASKOTE handwraps . . . MALONEY crossing insulators and casing seals . . . COROMAT underground wrap . . . KERMAC outerwrap . . . KEYSTONE asbestos felt . . . KAPCO rock shield . . . PITT CHEM tar base coatings.

There's a Midwestern specialist near you . . . ready to serve you quickly, expertly, economically.

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- Pittsburgh, Pa.
- Oklahoma City, Okla.
- New York, N.Y. (export)
- Caracas, Venezuela

pipeline people • *Cont'd.*

FRANK H. STONE, manager of the natural gas and gasoline department of La Gloria Oil & Gas Co., a Texas Eastern Transmission Corp. subsidiary, has been made a vice president of the company.

THOMAS H. PIKE JR. and JOHN E. CHUMBLEY are now division vice presidents of Tube Turns, Louisville, Ky. Also, F. E. MAC DONALD has been named controller. Mr. Pike is in charge of planning and Mr. Chumbley heads general sales operations for the division.

WALTER E. SUTTER is national manager of microwave sales for General Electric's communication products department in Syracuse, N. Y. Prior to his new appointment, Mr. Sutter was district microwave sales manager at Redwood City, Calif. General Electric also announces the appointment of I. TUNIS CORBELL as manager of microwave design engineering.

Harry Siert
Northern

Frank Roberts
Northern

Ernest Petersen
Northern

J. R. Brady
Northern

Several promotions have been announced by Northern Natural Gas Co., Omaha. HARRY H. SIERT, treasurer, is now vice president and treasurer. Other promotions include: FRANK H. ROBERTS to chief accounting officer and ERNEST M. PETERSEN to assistant to the president and assistant secretary. J. R. BRADY has joined Northern as reserves engineer in the reserves and availability section of the gas supply department.

2 WAY PROTECTION

AGAINST SERVICE STOPPAGE, COSTLY PIPELINE REPAIRS

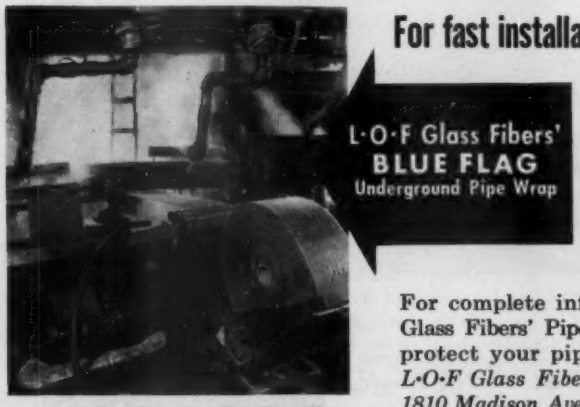
DURATAPE is especially designed for hot-wrapping by hand. Simply spiral-wrap around pipe joint and lightly flash with a butane torch during and after the wrapping operation.

Steel pipelines are often the very "lifeline" of production. When production lines are stopped because of a pipeline failure, losses are incurred.

Your investment in the serviceability of underground pipelines deserves the best protection possible—the kind of TWO-WAY protection you get from L·O·F Glass Fibers' *Duratape* and *Blue Flag*.

A mesh fabric woven of inorganic glass fiber yarn for extra strength and durability and heavily coated on both sides with coal tar or asphalt, *Duratape* protects field joints and fittings by forming a tough, high-dielectric barrier against corrosion.

Application is fast and easy. Pliable *Duratape* conforms smoothly to irregular contours and provides an extremely tight bond because of its compatibility with primers customarily used in pipeline work.



Specify Blue Flag glass fiber Pipe Wrap and Duramat Outer Wrap on all of your mill-wrapped pipe to help guard against underground corrosion.

For fast installation and long service—USE MILL-WRAPPED PIPE

Investigate the benefits of mill-wrapped pipe with coating reinforced by *Blue Flag*, the porous mat made from fibers of special inert glass, which resists the destructive action of soil chemicals. Used to strengthen enamel coating on underground pipelines, *Blue Flag* protects against cracking and backfill damage . . . preserves the pipeline for years beyond its normal life for less than ½ of 1% of its initial cost.

For complete information on how L·O·F Glass Fibers' Pipe Wrap Products can help protect your pipeline investment, write: *L·O·F Glass Fibers Company, Dept. 74-48, 1810 Madison Ave., Toledo 1, Ohio.*

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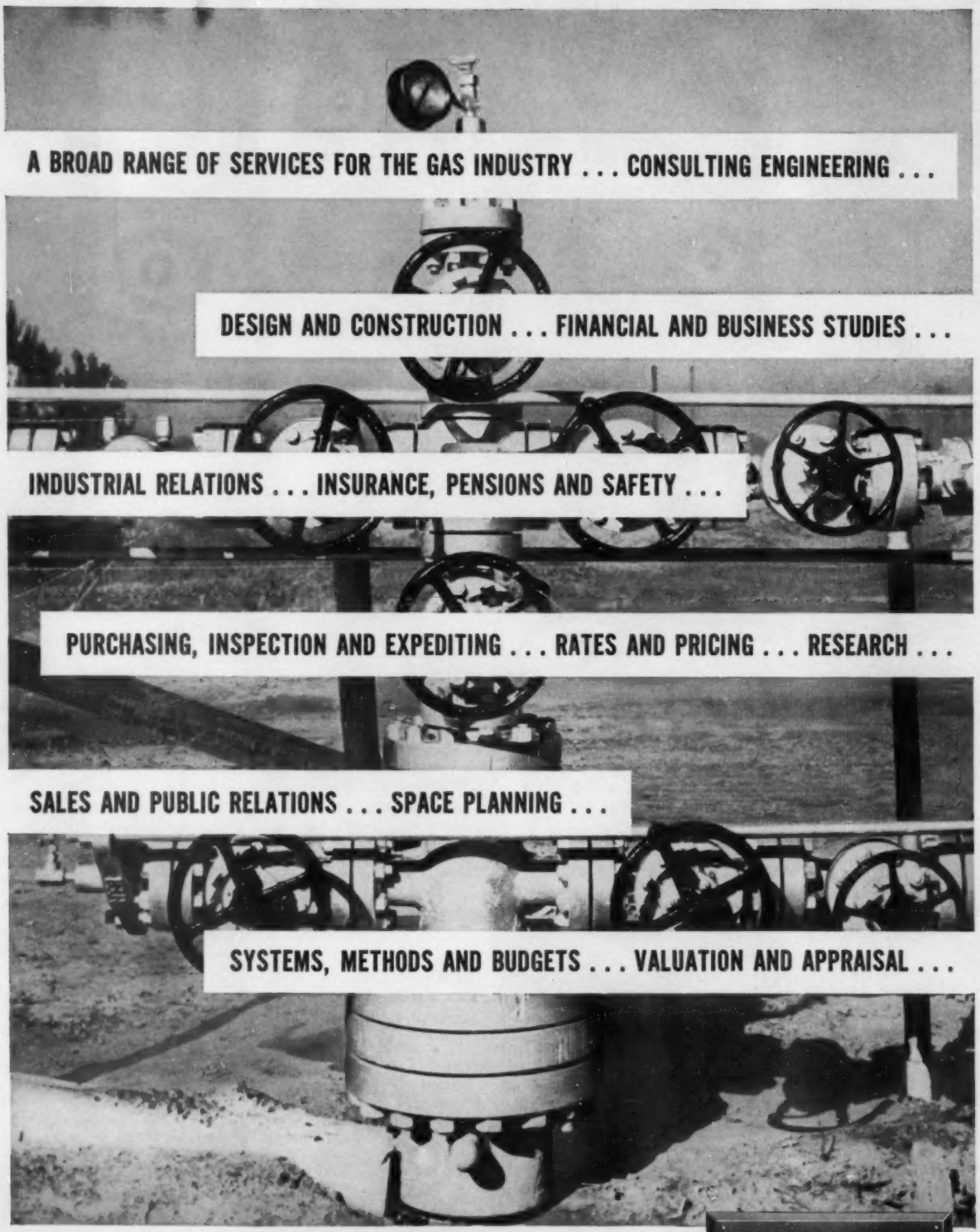
L·O·F GLASS FIBERS COMPANY TOLEDO 1, OHIO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RESET A VALVE UP THERE?

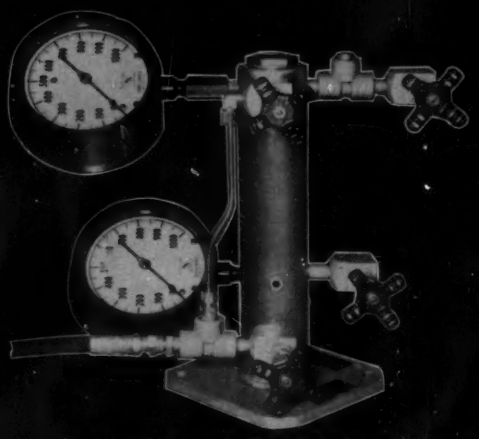
it's simple and easy with the Garrett Test Fixture

Sure, you can re-set a Garrett Relief Valve that's forty feet off the ground . . . or a hundred and forty, if you have a ladder to reach it and a small platform on which to work.

Easy resetting of both relief and blow-down is due in part to the design of the Garrett Valve, which has a separate control for each function. By use of the small, light weight Garrett Test Fixture and pressure from bottled nitrogen or other sources, either the set or reset pressure, or both, may be checked and changed in a few minutes time, using regular hand tools, and without removing the valve from the line.

This is another feature of Garrett Relief Valves that adds to the economy of your operations. It provides flexibility to meet changing conditions, reduces maintenance time, and permits you to *pressure check* the valves whenever you may desire.

For the full story of this and other money-saving features of Garrett Relief Valves, write for Bulletin No. RV-103.



The Garrett Test Fixture is simple to use, light and easy to carry, and completely accurate in operation.

got

Garrett Oil Tools, Inc.

P. O. BOX 2427 • LONGVIEW, TEXAS

USI

DIVISION OF U. S. INDUSTRIES, INC.

pipeline people • *Cont'd.*

Two sales engineers have been assigned by the Industrial Silencer Division of Burgess-Manning Co. J. A. KOLB joins the New York district office while LOUIS G. HALLA joins the staff of the Chicago district office.

Several promotions have been made by Tennessee Gas Transmission Co., Houston. J. SPENCER COLLINS is now exploration manager of the producing division. Since 1957, Mr. Collins has been staff manager, exploration. W. C. TILLETT is now manager, exploration contracts. He formerly was district exploration manager of the Bellaire, Texas district. Changes in the gas transmission department include naming T. K. DAVIS, J. L. PARRISH and B. J. WHITLEY superintendents. Mr. Davis is in charge of the compressor, measurement and gas control sections. Mr. Parrish is responsible for pipeline construction, research, corrosion control, and radio operations. And, Mr. Whitley supervises operation and maintenance of pipeline facilities in addition to his present assignment as manager of the transmission right-of-way section. ROSS O. PARKER JR. and GEORGE W. WHITE have been named assistant chief engineers.

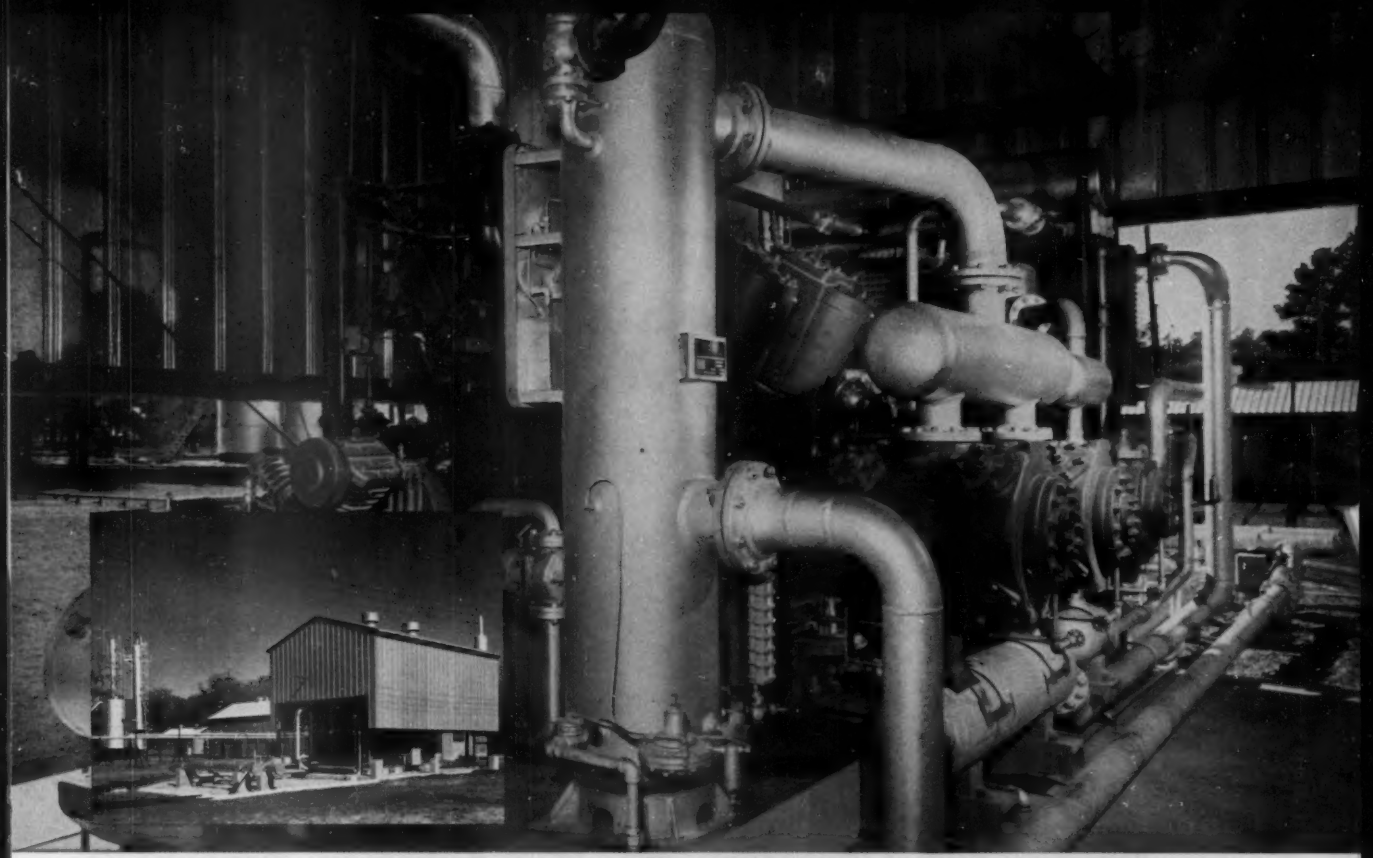
ANGUS MAC DONALD is director of engineering of both Motorola's Chicago military electronics center and the company's communications and electronics center. This assignment is part of a move to implement engineering liaison between the two groups.

E. R. HUCKMAN is now assistant field sales manager of the Foxboro (Mass.) Co. Mr. Huckman will continue as regional manager of the New York area, including sections of Connecticut, New Jersey, and New York. His duties as manager of the New York City branch have been assumed by H. R. CUSHMAN, formerly sales engineer at New York.

G. RICHARD WINDER is now vice president of marketing for the Ohio Injector Co., Wadsworth, Ohio. He succeeds WILLIAM G. SHEPARD, who has resigned.

JOSEPH H. WARD is a sales representative in the Industrial Chemicals Division of Pittsburgh (Pa.) Coke & Chemical Co. He will work in the New York territory of Brooklyn, Long Island, and upper New York state.

BEAIRD-INGERSOLL-RAND Packaged Compressor Plant



H. M. Harrell Recycling Plant booster station -- equipped with a Beaird - Ingersoll - Rand 6SVG 330 h.p. four cycle gas engine driven packaged compressor plant. Young radiator with lubrication oil cooler and gas coolers, and all necessary controls for unattended operation. Other sizes 120 to 660 h.p.

At Large Recycling Plant—

PACKAGED COMPRESSOR CONSERVES 2,000,000 CFD. IN LOW PRESSURE GAS

THE H. M. HARRELL RECYCLING PLANT serves a dual role. It represures wells in the Bammel Field and injects gas into formation storage for a large Texas utility. Designed to operate with 400 psig. suction, the original plant was unable to pick up 2 mmcfd. in low pressure gas produced by five nearby wells. This gas has now been added to the plant through the installation of a Beaird-Ingersoll-Rand 6SVG 330 h.p. packaged compressor.

Picking up from the wells at 20 to 25 psig. the Beaird unit boosts the gas through two stages delivering it to the plant compressors at 450 psig. Critical input gas temperatures at plant compressors were met by equipping the packaged compressor radiator with gas interstage and after cooling sections.

The packaged compressor has been designed for unattended operation. Its driving engine is equipped with a regulator which enables the speed to vary from half to full throttle, controlled by the suction pressure. Discharge pressures remain constant. Other controls and shutdown devices protect unit from unforeseen operating conditions.

Let us show you how a Beaird-Ingersoll-Rand packaged compressor can be designed to meet your special requirements.

another AMF product
PACKAGED COMPRESSOR PLANTS

LOWEST COST PER HORSEPOWER INSTALLED

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Corrosion prevention

Continued from page 30

because of the shape of the filler itself, multiplied by expansion and contraction.

Sag tests are run routinely to prove-out primer and enamel compatibility plus individual performance, of both primer and enamel. In *Fig. 4*, three enamel samples are applied, in usual sequence, without primer, with a relatively inferior primer, and finally with a superior primer. Results graphically prove primer efficiency and point up the necessity for using a good primer.

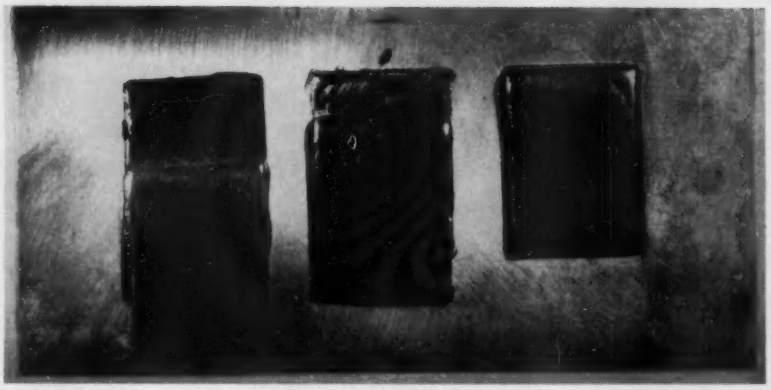

Fig. 4. Three identical basic asphalts, showing importance of good primers. The three specimens were subjected to oven temperatures of 200° for five hours. Results are obvious. Left-hand sample was unprimed; center sample, poor primer; right-hand sample, superior primer.

The final level of research is most rigorous of all—in-the-ditch examination of enamel applied to pipe surfaces.

Out of this composite mass of data, assembled by many people, over many years, interpreted by still many other experts, have developed today's asphalt pipe enamels. Also systems of cross checks and high-quality controls assure uniformity and dependability in every batch of asphalt enamel produced.

The final fruit of this concerted effort is what we may label a "super" pipe enamel, so new that it has not been announced to the trade. Its formulation has been known for several years, but only recently have test results, conducted over this period of time, been evaluated and the anticipated performance levels confirmed.

In addition to superlative qualities of adhesion, cohesion, and flexibility, there are distinct application advantages. This new product may be maintained at temperatures in excess of 525°F for several days without damage. If it isn't stirred, no great harm results. And, as we have pointed out, in every characteristic of adhesion, cohesion, flexibility, resiliency, etc., it is a standout. ■

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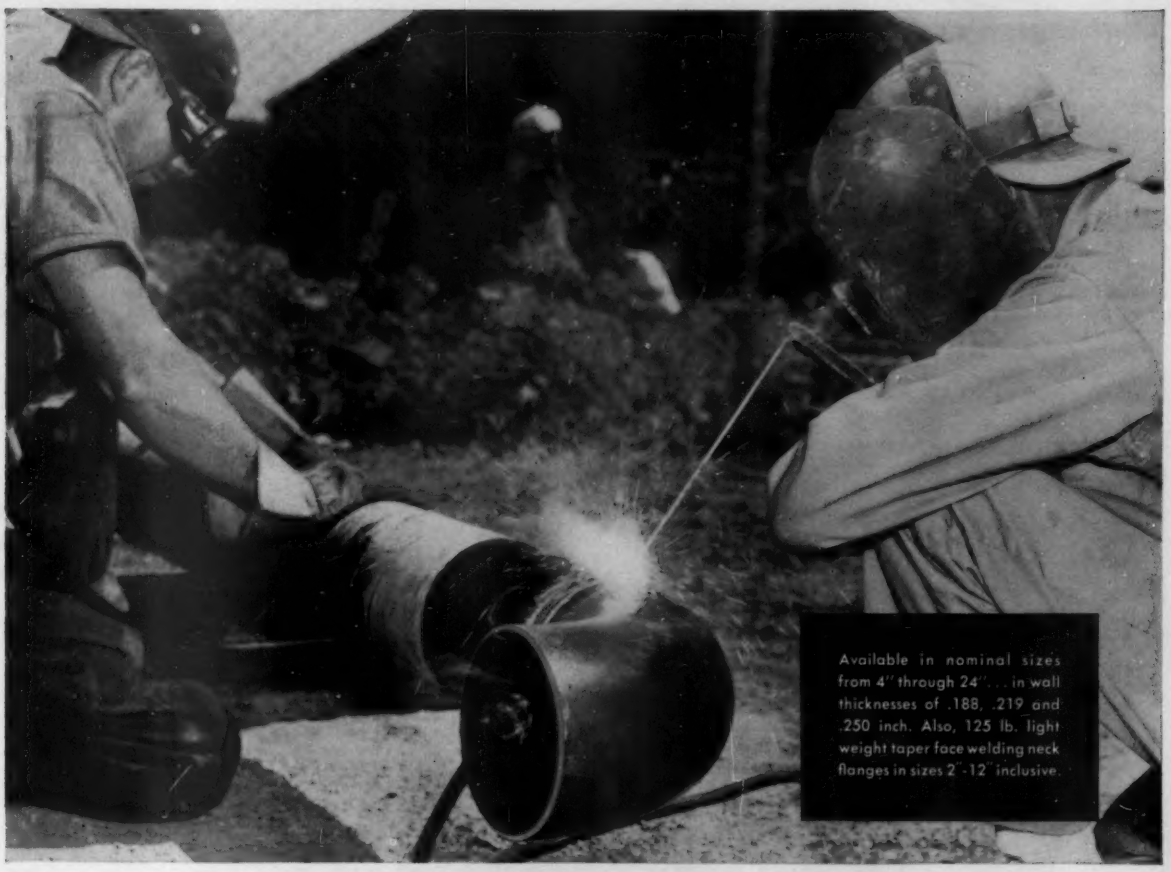
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A typical user of light weight steel piping reports these benefits:

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To enable you to take full advantage of the economies of "thin wall" steel piping, Tube Turns offers a complete line of light weight fittings. They are forged from seamless pipe. Meet all code requirements. Uniform wall thickness and true circularity permit field cutting of odd angles. Available promptly from Tube Turns' Distributors in all principal cities. Complete details in Bulletin TT 867, free on request.

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Washington • *Cont'd.*

from page 23

edly canceled orders for pipe—total cancellations may run as high as a million tons this year as a result of the Memphis decision, steel experts say — because of stalled pipeline expansion plans and the resulting lack of new gas caused by the Memphis decision.

Other distributors, however, figure it differently. According to Washington sources, they hope the high court will let them keep it. For the first time, they say, they will know from day to day how much their gas is costing, and when the price is likely to go up. At present, the first word they get is a higher bill from the pipeline.

And this group of utilities isn't, apparently, worried that the Memphis decision will in the long run hurt their supplies if allowed to stand. There will be a period when the pipelines will be pinched, they admit, and financing may be hurt temporarily.

But they claim that the pipelines and the FPC can learn to live with the longer rate procedures. Rate changes can either be negotiated, they argue, or they can be set high enough originally to take the longer procedures into effect.

Pipeliners, naturally, bitterly dispute these arguments. They claim the delays the decision will cause between higher costs and higher covering rates will drive many lines to the wall, and materially cut back expansion and, indirectly, gas exploration.

The biggest pipeline worry — some spokesmen admit — is the prospect that the Memphis case will cause them to cough up some $224 million in refunds to customers for higher rates granted over the past 20 years under the now disputed FPC procedure.

This, they say, would wreak financial havoc in the industry, and is a lot bigger headache than the possibility that they'll have to revise their rate-changing procedures in the future. If the Supreme Court upholds the Memphis case, they are desperately hoping it will knock out any retroactive aspects of the lower appeals court decision.

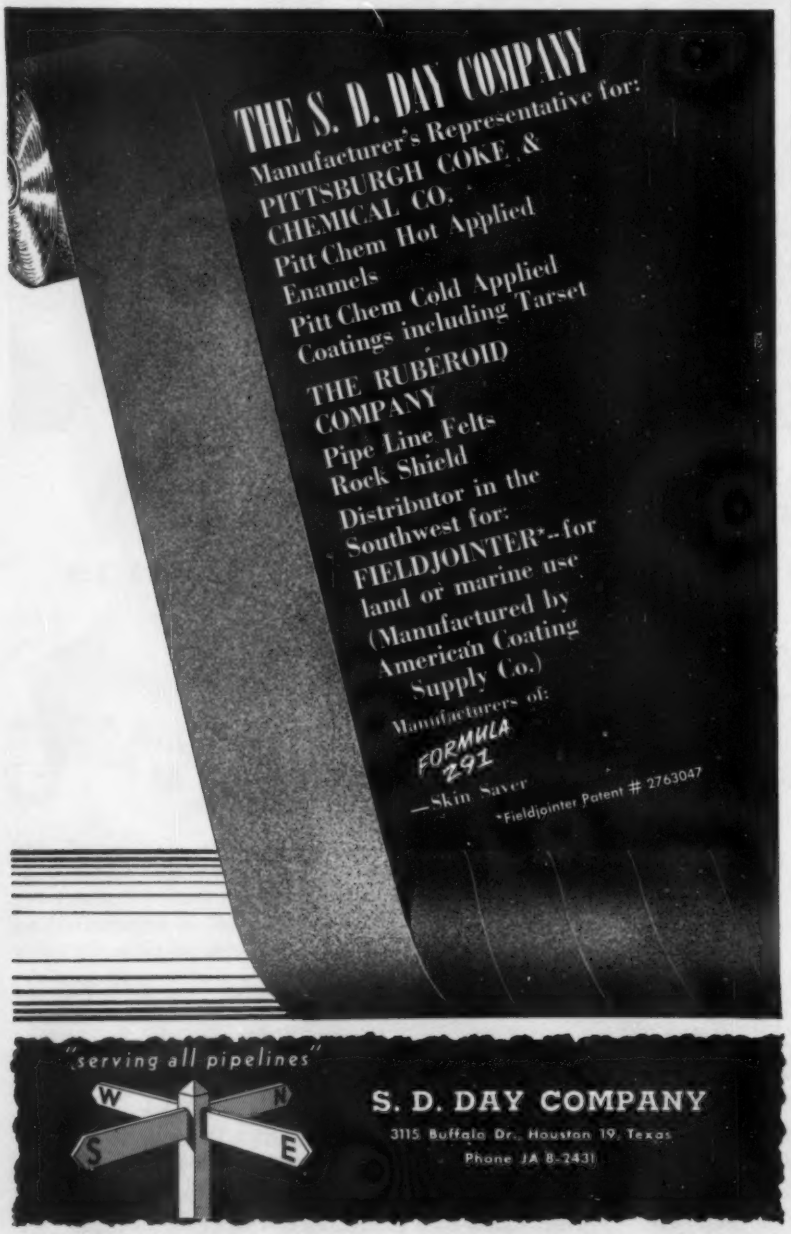
* * * * *

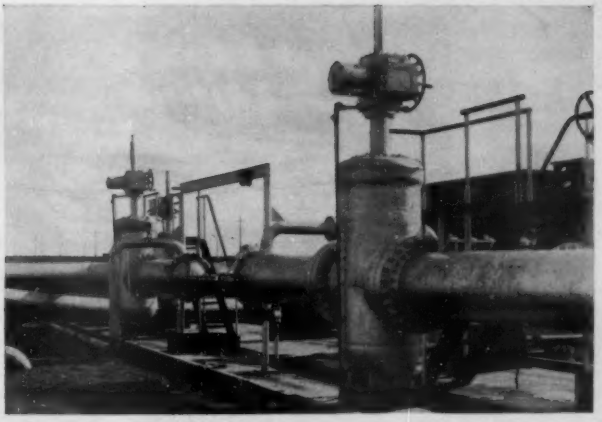
THERE is little chance of success for current efforts in Congress to pass legislation curbing the power of the Supreme Court to make law, rather than interpret it —a subject close to the hearts of many gas industry executives.

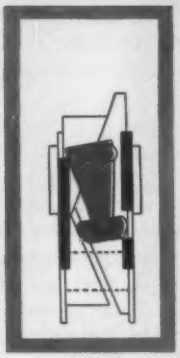
Before the end of this year, many gas industry people may be wishing, however, that such legislation was passed years ago.

The legislation (S. 2646) sponsored by Sen. William E. Jenner, R., Ind., would limit the appellate jurisdiction of the high court in an effort to prevent the court from assuming powers its critics claim were not authorized by the Constitution.

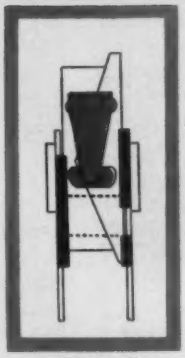
It would establish five categories in which the court would not have jurisdiction in the future: cases involving activities of congressional committees; actions to protect the nation from subversion among executive department employees; state legislation or action to control subversive activities within a



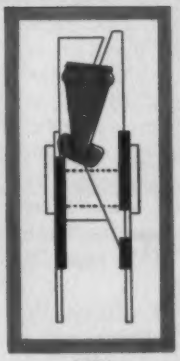




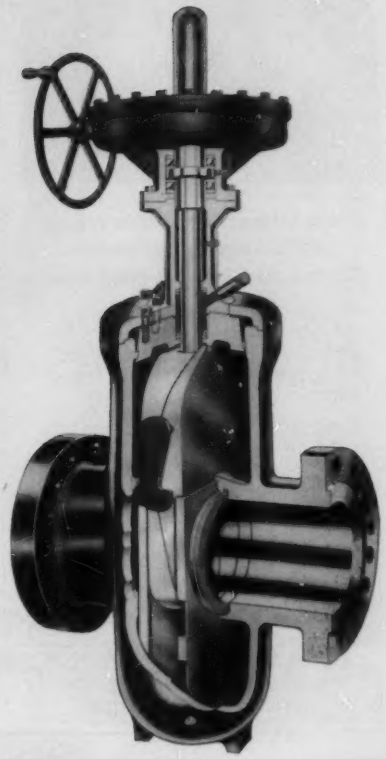
CLOSED POSITION



INTERMEDIATE POSITION



OPEN POSITION



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The exclusive centralizing mechanism found only in Leverlock Valves is the answer. This positive-acting mechanical device holds the gate and segment in a collapsed position so there is no tendency to wedge while valve is being opened or closed.

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- Through-Conduit assures full volume, free flow with no turbulence — no pressure drop — free passage of scrapers.
- Renewable Seats — may be installed while the valve is in the line.
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- Superfinished stems — Enclosed packing box — seat lubrication.

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TRANSMISSION LINES
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state; action by boards of education to control subversive activities of teachers, and action of states or boards of bar examiners in relation to admission of individuals to the practice of law.

The bill would also limit in other ways the power of the court to completely overthrow congressional acts except on the strict question of constitutionality.

The Supreme Court in recent years has come under increasingly heavy fire for decisions which critics claim go far beyond its judicial duties of interpreting law as enacted by Congress. Decisions including many on subversion and police practices, the segregation issue, and natural gas regulation are among those which have drawn this type of criticism.

Critics complain that too often the court bends to consider social or economic implications of cases, instead of the legal foundations for disputes.

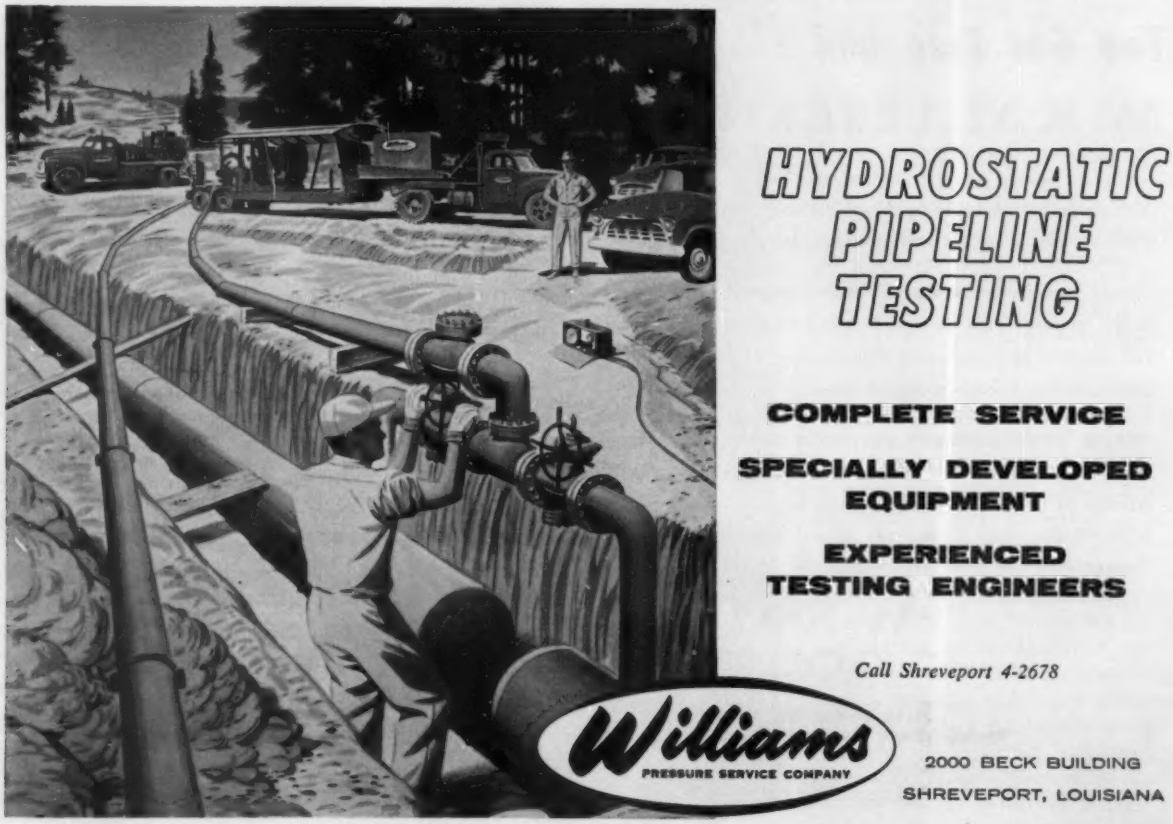
As now drafted, the Jenner bill would probably not solve present problems for the gas industry—most of the gas problems in which the court has been involved are long past or soon will be.

But there is some belief among Washington gas lawyers that such a law may be needed to make certain that any gas-industry legislation passed in the future will last more than a year or two without being turned aside by high court rulings.

Although the Jenner bill has support among the handful of Northern conservatives, and strong support among the Southern conservative bloc, it is not considered a popular bill. Many congressmen are leary of tampering with the basic legal structure of the country, unless there is strong pressure from voters.

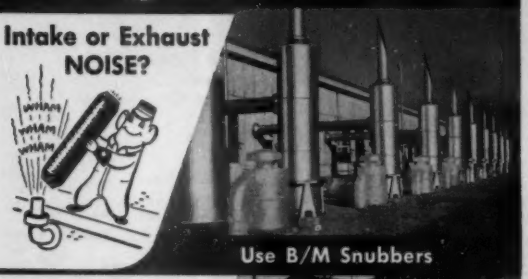
In the case of the Supreme Court bill, the belief on Capitol Hill is that it is being backed only by a handful of irritated groups, and not by the country generally.

It will, congressional leaders say, take a lot more pressure from the "grass roots" before the lawmakers seriously consider juggling laws governing the Supreme Court. ■



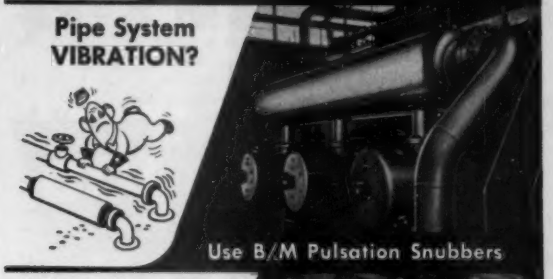
Having Trouble with...

Intake or Exhaust NOISE?



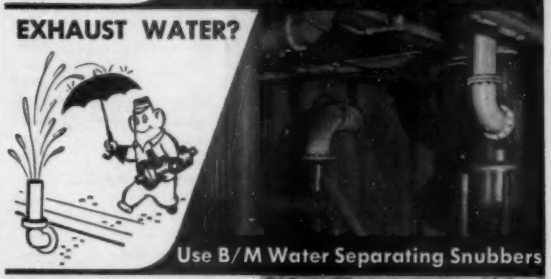
Use B/M Snubbers

Pipe System VIBRATION?



Use B/M Pulsation Snubbers

EXHAUST WATER?



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EXHAUST SPARKS?

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3. Water, sparks, or waste heat in your engine exhaust.

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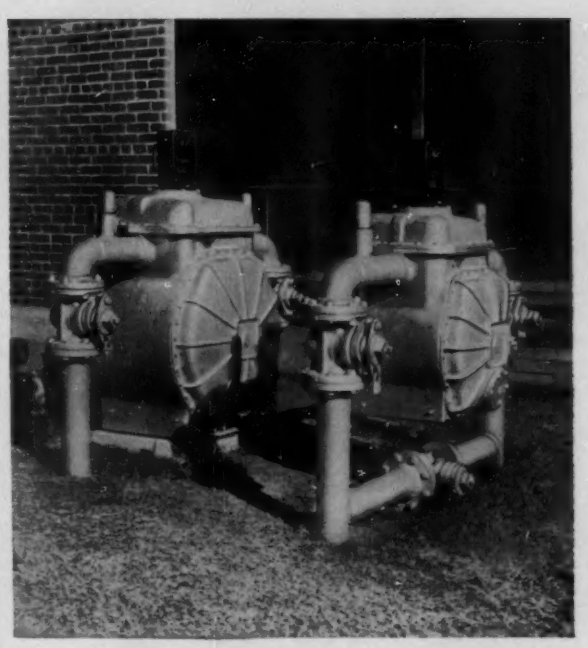
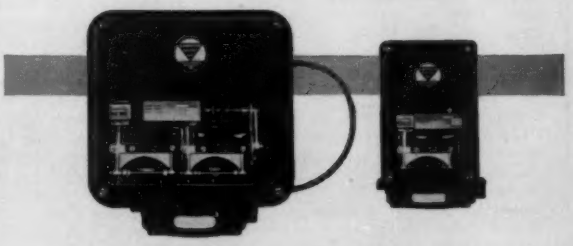


Temperature and pressure compensated metering continuously and automatically



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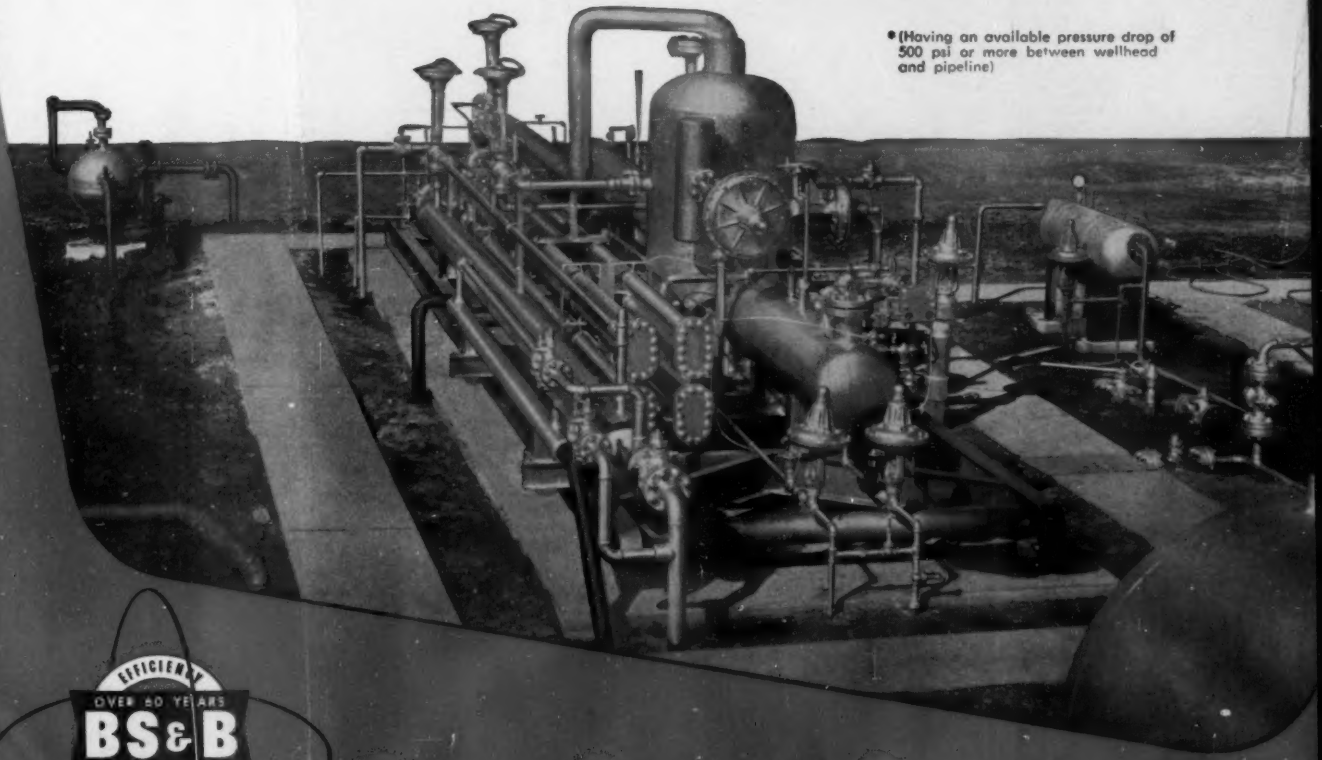

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